

INTERMOUNTAIN POWER PROJECT

PRELIMINARY ENGINEERING
AND
FEASIBILITY STUDY
APRIL 1979

VOLUME VI

LYNNDYL ALTERNATIVE SITE
DESCRIPTION OF THE PROPOSED ACTION

Prepared
By
The City of Los Angeles
Department of Water and Power
Under
General Supervision
of
The Board of Directors
Intermountain Power Project

Joseph C. Fackrell
President

and
Immediate Supervision
of

James H. Anthony
Project Engineer

TABLE OF CONTENTS

	<u>Page</u>
TITLE PAGE	i
CONTENTS	ii
INTRODUCTION	iv
 1.0 RAW MATERIAL SOURCES AND REQUIREMENTS	
1.1 Coal	1-1
1.2 Water	1-4
1.3 Lime	1-4
1.4 Borrow Materials	1-5
 2.0 GENERATING STATION AND SUPPORT FACILITIES	
2.1 Site Description	2-1
2.2 Buildings and Structures	2-1
2.3 Coal Storage Areas	2-2
2.4 Boilers and Generators	2-2
2.5 Cooling Towers	2-3
2.6 Wastewater Evaporation Ponds	2-4
2.7 Emission Control	2-5
2.7.1 Main Boiler Emission Control System	2-5
2.7.2 Particulate Removal System	2-6
2.7.3 Sulfur Dioxide (SO ₂) Removal System	2-6
2.7.4 Nitrogen Oxides (NO _x) Control System	2-7
2.7.5 Stacks	2-7
2.7.6 Fugitive Dust Control	2-7
2.8 Ash and Scrubber Waste Disposal	2-8
2.9 Switchyard and Converter Station	2-9
2.10 Control and Instrumentation System	2-9
2.11 Sanitary Waste System	2-9
 3.0 WATER SUPPLY SYSTEM	
3.1 Surface Water	3-1
3.2 Groundwater	3-3
3.3 Conveyance	3-3
 4.0 TRANSPORTATION SYSTEM	
4.1 New Roads	4-1
4.2 Railroad Spurs	4-2
4.2.1 Route	4-2
4.2.2 Construction	4-2
4.3 Operation	4-3

TABLE OF CONTENTS (continued)

	<u>Page</u>
5.0 POWER TRANSMISSION SYSTEM	
5.1 Southern California Transmission System	5-1
5.1.1 Routing	5-1
5.1.2 Transmission Line Size and Design	5-6
5.1.3 Access and Service Roads	5-6
5.1.4 Construction Phases and Activities	5-6
5.1.5 Maintenance	5-8
5.1.6 Stations	5-8
5.2 Utah Transmission System	5-8
5.2.1 Routing	5-9
5.2.2 Transmission Line Size and Design	5-12
5.2.3 Access and Service Roads	5-12
5.2.4 Construction Phases and Activities	5-12
5.2.5 Maintenance	5-13
5.2.6 Stations	5-13
5.3 Microwave Communication System	5-14
5.3.1 Terminal Stations	5-14
5.3.2 Repeater Stations	5-14
6.0 UTILITIES	
6.1 Power Line for Plant Site Construction Power	6-1
6.2 Project Power Distribution System	6-1
6.3 Project Telephone Service	6-1
7.0 COMMUNITY DEVELOPMENT	
7.1 Proposed Development	7-3
7.2 Community Development Plan	7-4
7.3 Financing	7-5
7.4 Impact Monitoring	7-6
8.0 CONSTRUCTION AND PERMANENT WORK FORCE	
8.1 Generating Station	8-1
8.2 Transmission and Communication Systems	8-4
8.3 Lime Supply and Transportation System	8-8
9.0 ENVIRONMENTAL MONITORING	
9.1 Meteorological Monitoring	9-1
9.2 Stack Emission Monitoring	9-1
9.3 Water Quality Monitoring	9-1
10.0 DECOMMISSIONING	10-1
11.0 LIST OF REFERENCES	11-1
12.0 FIGURES	12-1

INTRODUCTION

The Intermountain Power Project (IPP), in response to concerns expressed by the Secretary of the Interior regarding possible air quality impacts related to the proposed Project at the Salt Wash Site in Wayne County, Utah, and the recommendation of the Utah Interagency Task Force on Power Plant Siting regarding alternative sites for the Project, has investigated the feasibility of siting the power plant at an alternative site known as "Lynndyl", which is located in Millard County, Utah. This report has been prepared to describe the Project at the Lynndyl Alternative Site as shown in Figures AL1 and L1.

Specifically, the report includes a narrative description and appropriate figures and tables for the raw material sources and requirements, generating station and support facilities, water supply system, transportation system, power transmission system, utilities, community development, construction and permanent work force, environmental monitoring, and decommissioning.

This report has been prepared in a format and to a level of detail which is essentially identical to the description of the Project in the U. S. Department of the Interior, Bureau of Land Management's (BLM's) preliminary draft Environmental Statement on the Project. Additional studies, prepared by IPP consultants and related to the proposed Project, at the Lynndyl Alternative Site are listed in the reference section.

SECTION 1.0

RAW MATERIAL SOURCES AND REQUIREMENTS

IPP has identified sufficient quantities of raw materials to operate the proposed facility during the life of the Project, which is estimated as 35 years for each of the four units. Quantities are based upon an average annual capacity factor estimated at 75 percent for each unit over its estimated life. For maximum annual rates, a maximum plant capacity factor of 85 percent was utilized. Raw materials include those which would be necessary for plant operation (coal, water, and lime) and those necessary for construction (sand and gravel or "borrow material").

1.1 COAL

The estimated coal requirements during the Project's life would be 296 million tons with an average annual consumption rate of 7.78 million tons. The maximum yearly total would be 9.52 million tons. These figures are based on an average lifetime heating value of 12,000 Btu/lb. for the coal. The maximum demand for four units is estimated to be 1600 tons of coal per hour.

The coal for the Lynndyl Alternative Site will most likely be obtained from a number of existing mines and/or leases evaluated by the United States Geological Survey in the Central Utah Regional Coal Development Environmental Statement. Within this region, the areas of primary interest are located in the Northern Wasatch Plateau coalfield and the Book Cliffs coalfield because of their proximity to the existing commercial railroads as shown on Figure AL2. There are also significant reserve holdings in the Southern Wasatch and Emery coalfields which could be mined and the coal transported to the plant site to help meet the demand. Table 1-1 shows typical coal qualities which a number of the existing leaseholders are willing to guarantee from their respective properties.

TABLE 1-1

TYPICAL COAL QUALITIES

<u>Area</u>	<u>BTU/#</u>	<u>Sulfur</u> <u>% by Weight</u>	<u>S/MMBTU</u>	<u>Ash</u> <u>% by Weight</u>	<u>Ash/MMBTU</u>
1	12,200	0.5	0.41	8.8	7.2
2	11,950	0.54	0.45	10.5	8.7
3	12,150	0.63	0.51	6.2	5.1
4	11,000	0.60	0.56	13.0	11.8
5	12,200	0.60	0.49	6.0	4.9
6	12,770	0.79	0.61	8.4	6.6
Average	12,000	0.61	0.51	8.8	7.3

The average coal quality expected over the life of the plant is represented by the average indicated in the table above. However, due to the fact that the Lynndyl Alternative Site is adjacent to an existing commercial railroad, there are numerous other coal mines which could also provide coal to help meet the Project needs.

There may be times during the operation of the Project that significant quantities of "spot market" coal may be required (due to labor strikes, etc.). Since it is very difficult to project coal quality information for this kind of supply, the worse case emission rates for air quality assessment were established by modifying the average coal quality data shown in Table 1-1 by decreasing the heating value by 15 percent, increasing the sulfur content by 30 percent, and increasing the ash content by 15 percent. This will provide reasonable flexibility in the coal quality which may be burned at the plant. Therefore, the maximum emission rates (shown in Table 2-3) which are used for the 3-hour, 24-hour, and annual air quality assessments are based on the following coal characteristics:

<u>BTU/#</u>	<u>Sulfur</u> <u>% by Weight</u>	<u>S/MMBTU</u>	<u>Ash</u> <u>% by Weight</u>	<u>Ash/MMBTU</u>
10,200	0.79	0.77	10.1	9.9

Typical trace element ranges are listed in Table 1-2.

TABLE 1-2

COAL TRACE ELEMENT ANALYSIS

<u>Trace Element</u>	<u>Range ppm</u>
Antimony	0.0 to 0.5
Arsenic	0.2 to 3.0
Barium	6.0 to 130.0
Beryllium	0.3 to 6.0
Boron	38.0 to 190.0
Bromine	0.0 to 2.0
Cerium	5.0 to 32.0
Cesium	0.1 to 10.0
Chromium	8.0 to 26.0
Cobalt	2.0 to 14.0
Copper	7.0 to 15.0
Europium	0.0 to 0.6
Fluorine	23.0 to 570.0
Gadolinium	0.0 to 0.5
Gallium	2.0 to 18.0
Germanium	0.0 to 3.0
Lanthanum	4.0 to 39.0
Lead	1.0 to 7.0
Lithium	2.0 to 180.0
Manganese	5.0 to 64.0
Mercury	0.03 to 0.21
Molybdenum	8.0 to 28.0
Neodymium	0.4 to 2.0
Nickel	2.0 to 20.0
Niobium	0.9 to 6.0
Praesdyumium	0.2 to 3.0
Rubidium	0.2 to 9.0
Samarium	0.0 to 0.9
Scandium	4.0 to 26.0
Selenium	0.0 to 1.0
Strontium	21.0 to 320.0
Thorium	0.0 to 7.0
Tin	0.0 to 2.0
Tungsten	0.0 to 2.0
Uranium	0.0 to 9.0
Vandium	4.0 to 24.0
Yttrium	4.0 to 37.0
Zinc	4.0 to 44.0
Zirconium	11.0 to 57.0

The concentrations of the following trace elements were found to be less than 0.3 ppm:

Bismuth	Holmium	Palladium	Tantalium
Cadmium	Iodine	Platinum	Terbium
Dysprosium	Iridium	Phenium	Telluvium
Erbium	Lutecium	Phodium	Thallium
Gold	Osmium	Silver	Yherbium
Hafnium			

The in-plant coal handling system would receive coal from unit train; unload, weigh, and sample; store in stockpiles adequate to assure a reliable coal supply to the plant; and supply the required quantity and quality of coal at rates demanded by the plant. Coal would be blended by spreading thin layers of different coal grades in piles to obtain the desired coal characteristics.

1.2 WATER

The maximum annual water supply required for the Project would be 45,000 acre-feet as indicated in Figure AL9. The annual in-plant consumption under normal weather conditions and 85 percent plant capacity factor would be approximately 24,300 gallons per minute (gpm) or 39,200 acre-feet per year. The design water consumption for four units generating at 100 percent capacity during the summer months would be approximately 33,000 gpm.

The Project proposes to obtain its water supply through purchase of shares in local water companies, and purchase of individual groundwater rights from local well owners. The amount of shares purchased from the water companies would provide a firm yield of up to 39,500 acre-feet per year. The amount of individual well rights purchased would allow pumpage of up to 5500 acre-feet per year. Additional description of the water supply is included in Section 3.0.

1.3 LIME

A high calcium, pebble lime would be used for removing sulfur dioxide (SO₂) from the flue gasses and for raw water softening.

Lime would be purchased from an outside supplier and transported by rail to the plant site. The Flintkote Company, U.S. Lime

Division (located 45 miles west of Salt Lake City near the town of Grantsville, Utah), has assured IPP that they would be able to supply the plant's needs for the proposed facilities.

Approximately 22 railroad cars per week would be needed to supply the plant needs. The estimated total requirements during the Project's life is 3.7 million tons based on average grade coal and 75 percent capacity factor.

1.4 BORROW MATERIALS

Earth materials for construction of dikes, cover for the synthetic liners in the solid waste and evaporation pond areas, and for soil cover of the solid waste area would be developed from borrow sites on the plant site. These materials would be predominantly silty sands.

Rock construction materials, such as aggregate, sand, and gravel, would be needed for concrete and asphalt mixes, road base, lining of dikes, and construction of railroad spurs. IPP has identified five potential borrow sites within 30 road-miles of the plant site which contain adequate quantities of suitable materials. The sites are located as shown in Figure AL29 and described in Table 1-3. These sites are located on private or leased state lands. The sites have either been previously utilized for rock material or have been included in an inventory compiled by Utah Division of Highways. The total rock materials needed would be about 1.2 million cubic yards.

TABLE 1-3

MATERIAL BORROW SITES
(Approximate Acreages)

<u>Borrow Site</u>	<u>Legal Description</u>	<u>Est. Available Quantity of Mat'l. (Million Cubic Yards) (a)</u>	<u>Potential Borrow Site Area (Acres)</u>
14052 A	S11, T15S, R4W	Greater Than 1.0	40
14056 B	SE1/4, S35, T15S, R4W	1.5-3.0	160
14056 C	SW1/4, S9, T14S, R4W	1.0	160
14056 D	NW1/4, S9, T14S, R4W	1.0	160
14056 E	N1/2, NE1/4, S23, T15S, R5W	1.0-3.0	80

(a) Dames and Moore, 1978

SECTION 2.0

GENERATING STATION AND SUPPORT FACILITIES

2.1 SITE DESCRIPTION

Application will be made for acquisition, in fee, of approximately 4640 acres of land for the generating station and support facilities as shown in Figure AL5. All of this land is public land administered by BLM. Figure L2 is a photograph of the undisturbed site.

2.2 BUILDINGS AND STRUCTURES

Figures BL1 and EL3 show the proposed generating facility. Support facilities or structures at the plant site would include the plant warehouse and shops building, the water treatment building, the automotive service building, the administration building, and the railroad maintenance shop which would provide maintenance services for the rolling stock of the coal haul railroad.

Buildings and structures would be designed to blend with the site. IPP proposes to use careful design and compatible textures, colors, and materials. The basic building materials for the plant enclosures and miscellaneous buildings would consist of the following:

- Concrete masonry units with integral color.
- Preformed metal siding with integral color, embossed finish and insulated where required.
- Metal roof deck, rigid roof insulation over the deck, and built-up roofing.

Concrete masonry would generally be used on the lower structures and enclosures, while the metal siding would be used for high structures, screens, and miscellaneous buildings on the site. All structures, foundations, and structural components of the buildings would be designed in accordance with accepted engineering practices. Figure BL1 depicts the proposed layout of the plant site and location of major buildings and structures.

Temporary facilities for construction would be located at the plant site. An aggregate processing plant would be constructed

Temporary facilities for construction would be located at the plant site. An aggregate processing plant would be constructed at the site to support the concrete mixing plant. Water for aggregate washing, up to 1200 gpm, would be supplied by the construction water system. Wastewater would be discharged into one of the plant's permanent evaporation ponds.

As construction work is completed, all temporary structures, fencing, utilities, and refuse would be removed. The cleared area would be blended into the undisturbed landscape of the vicinity. Borrow sites would be smoothed and graded to blend with the adjacent landscape. All temporary construction access roads would be closed and similarly rehabilitated.

2.3 COAL STORAGE AREAS

The coal storage areas, shown in Figure BL1, would hold about 1,860,000 tons of coal and would allow the plant to operate at rated capacity for 48 days without coal delivery. Of this total capacity, 3 days or 120,000 tons of storage would be provided in the two active storage piles, 5 days or 190,000 tons of storage would be in the small reserve pile, and 40 days or 1,550,000 tons of storage would be in the large reserve pile. In addition, an emergency active coal pile would be formed when the stacker-reclaimer is out of service.

20' high 4:1

2.4 BOILERS AND GENERATORS

Each of the four generating units would be driven by steam produced by a conventional drum type, balanced draft, pulverized coal-fired boiler. Each boiler, at rated capacity, would generate 5,700,000 pounds per hour of main steam at a pressure of 2475 pounds per square inch and with a temperature of 1005° Fahrenheit (F) with reheat steam at 1005°F when burning 388 tons per hour of pulverized coal. Each unit will have one tandem-compound, four-flow, reheat steam turbine rated at 750 megawatts (Mw) net at 2400 pounds per square inch, gage (psig) and 1000°F inlet steam conditions. Figure BL1 depicts the physical arrangement of the boilers, generators, and related equipment.

The boiler unit would be designed to operate with the coal characteristics shown in Table 2-1.

TABLE 2-1

DESIGN COAL CHARACTERISTICS

Heating Value Btu/lb., Dry	10,600.0 - 13,500.0	
Btu/lb., Wet	8,930.0 - 12,970.0	
Moisture, Percent	4.0 -	15.0
Carbon, Percent	53.0 -	73.0
Hydrogen, Percent	3.6 -	5.0
Nitrogen, Percent	1.0 -	1.2
Sulfur, Percent	0.3 -	1.0
Chloride, Percent	0.01 -	0.03
Oxygen, Percent	10.0 -	20.0
Ash, Percent	4.4 -	13.0
Percent Composition of Ash		
Phosphorous Pentoxide, P_2O_5	0.04 -	1.3
Silica, SiO_2	44.0 -	73.0
Ferric Oxide, Fe_2O_3	2.0 -	11.0
Alumina, Al_2O_3	4.0 -	27.0
Titania, TiO_2	0.2 -	1.5
Lime, CaO	2.0 -	13.0
Magnesia, MgO	0.2 -	5.0
Potassium Oxide, K_2O	0.2 -	0.5
Sodium Oxide, Na_2O	0.2 -	3.2

2.5 COOLING TOWERS

A system using rectangular mechanical draft cooling towers would transfer heat rejected from the power plant to the atmosphere. The eight wet cooling towers would extract heat from the plant water circulation system.

Each cooling tower would be designed for 133,500 gpm of circulating flow with 114°F inlet water temperature and 84°F outlet water temperature. The cooling tower would reject heat at a rate of 4 billion Btu/hr under design conditions.

Operation of the cooling towers would result in evaporative losses of water, drift losses, and blowdown water losses. Blowdown water would be routed to the flue gas desulfurization system for use in removing SO_2 , with any excess then routed to the wastewater evaporation ponds. The average yearly cooling tower drift and evaporation losses are expected to be 20,700 gpm. The average yearly cooling tower blowdown is expected to be 2200 gpm yielding total average cooling tower losses of 22,900 gpm.

2.6 WASTEWATER EVAPORATION PONDS

Evaporation ponds would dispose of plant wastewater that contains an excessive concentration of dissolved solids. Plant wastewater results from four primary processes, as indicated in Table 2-2.

TABLE 2-2
PLANT WASTEWATER

<u>Sources</u>	<u>Average Quantity gpm</u>
Cooling tower blowdown	300
Demineralizer and make-up softeners	160
Various maintenance wash waters	200
Storm runoff	<u>15</u>
Total	675

The total annual plant wastewater volume would average 1100 acre-feet. This water would be evaporated in order to meet the criterion of "zero discharge" of pollutants to surface or groundwater bodies.

The proposed wastewater evaporation ponds would be located in the westerly portion of the plant site as indicated in Figure AL5. The ponds would have a net surface area of approximately 300 acres. The total area would be divided into 8 sections, each having a maximum reach of 2500 feet to minimize wave action.

The wastewater evaporation ponds would be sized to contain all settleable and dissolved solids during the life of the plant (approximately 2.5 ft) plus storage of the total plant wastewater for 1 year (approximately 4.5 ft), plus freeboard (2 ft). The ponds would be lined with a synthetic liner covered with a layer of native soils. Groundwater monitoring wells would be located up and down gradient (east and west, respectively) from the ponds. Figure AL8 shows a typical section for the proposed ponds.

Area on the plant site is being reserved for additional evaporation ponds in the event that dry flue gas desulfurization

technology advances to a point where that type of system is favored over the wet lime slurry scrubber process. In this event, additional ponds having a net surface area of approximately 830 acres would be necessary to handle an increased wastewater volume.

2.7 EMISSION CONTROL

2.7.1 MAIN BOILER EMISSION CONTROL SYSTEM

The emission control system would control particulates, SO₂, and nitrogen oxides (NO_x) emissions for which both stack emission and ambient air quality standards have been established. Table 2-3 shows the estimated maximum abated emissions from the power plant boilers.

TABLE 2-3
ESTIMATED MAXIMUM PLANT EMISSIONS (a)

	Estimated Stack Emissions (lbs/million Btu)	Estimated Emission for 4 Units (tons/day)
<u>Maximum Emissions(b)</u>		
Sulfur dioxide	0.155	55.6
Particulates	0.019	7.1
Nitrogen oxides	0.7	251.5

(a) Calculated emissions shown are based on 100 percent load. The maximum annual capacity factor is 85 percent, and the average annual capacity factor is 75 percent.

(b) Corresponds to 0.79 percent sulfur and 10.1 percent ash content with higher heating value (wet) of 10,200 Btu/lb.

2.7.2 PARTICULATE REMOVAL SYSTEM

Hot electrostatic precipitators will be designed to remove a minimum of 99.5 percent of the particulate matter (fly ash). In addition, the SO₂ scrubber system will remove approximately 50 percent of the fine particulate matter not removed by the precipitators, resulting in an overall particulate removal efficiency of 99.75 percent.

Hot electrostatic precipitators have been successfully operated on low sulfur, coal-fueled power plants. This system removes particles suspended in the flue gas by providing them with an electrostatic charge. This particle charge is opposite to the charge given to the collecting plate. The particles then migrate to the collecting plate, become attached, and are removed.

2.7.3 SULFUR DIOXIDE (SO₂) REMOVAL SYSTEM

The SO₂ removal system, a horizontal crossflow wet lime scrubber, will be designed to remove 90 percent of the SO₂ produced in the boilers. Tests indicate that such a design will also result in the additional removal of approximately 50 percent of those particulates not collected by the electrostatic precipitator.

The selection of the wet lime process is based on the availability of absorbent material, applicable operating experience of the process, reliability, waste disposal requirements, ability to remove 90 percent of the SO₂ in the flue gas, and economics.

In each of the scrubber modules, saturated flue gasses would pass through four separate spray stages where a lime slurry is sprayed perpendicular to the flow of the flue gasses. The absorption of SO₂ in the flue gas is accomplished by contact with lime resulting in the chemical reaction of calcium with SO₂.

The final waste sludge would consist mostly of calcium sulfate with small amounts of magnesium sulfate, sodium sulfate, sodium chloride, calcium carbonate, fly ash, and inert materials from the lime. The average weekly production of scrubber sludge having a 60 percent solids content would be approximately 12,550 tons.

2.7.4 NITROGEN OXIDES (NOx) CONTROL SYSTEM

NOx formation occurs in the combustion zone of the boiler and results from thermal fixation of atmospheric nitrogen and conversion of fuel-bound nitrogen. Combustion modification techniques provide effective means of NOx emission control through lowering the peak flame temperature and minimizing oxygen availability for combustion.

The techniques which would be most effective in controlling NOx emissions depend upon the boiler design. Therefore, the combustion techniques would be evaluated and selected according to the specific boiler selected and applicable state and federal regulations.

2.7.5 STACKS

Two 710-foot-high stacks each containing two 30-foot-diameter liners would be used to enhance emission dispersion and dilution. The lighting of the stacks for aircraft safety would conform with Federal Aviation Administration (FAA) regulations.

2.7.6 FUGITIVE DUST CONTROL

In the coal unloading and transport area, water sprays would be used at the rotary car dumper area when a coal car is unloaded. The water sprays would be directed against the airborne dust to cause it to agglomerate and settle rapidly. Similar sprays would also be used at the discharge points of all conveyors in operation, except the conveyors feeding the coal silos.

All conveyors, except a portion of the stacker-reclaimer conveyor, would be inside covered structures. This would prevent windblown coal dust.

Earth berms, the same height as the coal piles, would protect the active coal storage piles from wind. Water sprays would be used at the discharge point of the stacker conveyor to minimize dusting. The reserve coal storage piles would be sprayed with a surface crusting agent.

2.8 ASH AND SCRUBBER WASTE DISPOSAL

The ash handling systems would remove ash and mill pyrites from the boiler, the fly ash from the electrostatic precipitator hoppers, mix fly ash and scrubber sludge for disposal, and transport these materials to holding containers for storage and preparation for truck disposal. An on-site disposal area, located about 1 to 2 miles from the plant power block, has been selected along with haul routes and are shown in Figure AL5.

Up to 52 million tons of ash and scrubber sludge would be produced during the operational life of the plant. About 620 acres filled to a depth of 40 feet would be required for these materials at the disposal site. Additional area would be required to accommodate drainage facilities, haul roads, and evaporation ponds. Disposal facilities would be designed for a peak rate of 9600 tons per day.

Leachates, if any, from the disposal site would be intercepted by an impermeable synthetic liner at the bottom of the fill. Any liquid intercepted would be drained to an observation and monitoring sump and then to the evaporation ponds. Additional groundwater observation wells would be constructed up and down gradient from the fill and monitored during the operation of the plant. Figure AL7 shows a typical section through the fill.

Should the sludge-ash mixture prove unable to support itself on a slope, an earth fill embankment would be constructed at the toe of the fill.

During placement of the fill, surface runoff would be contained by constructing a down-slope dike on the fill, where it would pond and evaporate.

Native soil from the plant site area will be stockpiled and after an area reaches final grade, a 2-foot layer of stockpiled native soil would be placed on the surface and compacted. The final surface of the fill would be contoured to blend with adjacent topography. Tests would be conducted on various revegetation plans to determine their feasibility. If revegetation is impractical, the area would be treated with chemical/mechanical soil stabilizers or would be terraced and provided with drainage structures to intercept runoff and sediments.

2.9 SWITCHYARD AND CONVERTER STATION

The switchyard and converter stations would distribute power from the plant to the Southern California Transmission System on two 500-kV d-c lines, to the Utah Transmission System on two 345-kV and one 230-kV a-c lines, and to the water supply system on two 46-kV a-c lines.

2.10 CONTROL AND INSTRUMENTATION SYSTEM

Centralized control and monitoring systems would be provided to optimize operation and station manning. All major equipment required to be operator controlled would be controlled from either the central control room or from local control boards.

2.11 SANITARY WASTE SYSTEM

The sanitary waste system would consist of a pipeline collection network discharging to a sewage treatment plant and an effluent discharge line leading to the sewage lagoon. The design capacity of the system would be 19,000 gal/day assuming a loading factor of 40 gal/day per person.

Preliminary design studies indicate that a sewage lagoon treatment system is best suited for conditions at the site. A total lagoon size of about 3 to 5 acres would be sufficient to handle the daily load. The location of the lagoon is shown in Figure BL1. Under the criterion of zero pollutant discharge, the lagoon would be lined as required by the Utah State Branch of Environmental Health Services.

SECTION 3.0

WATER SUPPLY SYSTEM

The Project would consume water primarily for plant cooling. The maximum annual plant requirement is estimated at 45,000 acre-feet. This maximum use is based upon the operation of the plant at 85 percent capacity factor, normal weather conditions, and includes a reserve of 5800 acre-feet to provide for variations in weather and plant operating conditions. The water budget for the maximum usage years is shown in Figure AL9.

The Project proposes to obtain its water supply through purchase of shares in local water companies and purchase of some individual groundwater rights. Inasmuch as possible, the Project proposes to purchase shares on an even geographical distribution throughout the water company service areas, and/or to purchase those shares which presently are associated with the highest water losses.

The number of shares required from the various companies was determined on the basis of the maximum plant demand, and a firm water yield analysis. The analysis was premised upon the quantity of water that would accrue to rights during the most sustained historical dry cycle, and thus assures the Project water supply through the projected worst hydrological conditions. Figure L4 shows the hydrograph for the Lower Sevier River based on historical flows. The period between 1951 through 1970 was used as the basis for the firm water yield analysis.

The principle of purchasing water company shares also affords the Project water storage privileges, which would be required by the Project during a dry cycle.

3.1 SURFACE WATER

A firm yield of up to 39,500 acre-feet per year would be obtained through purchase of shares in five existing water companies. The five companies include Delta Canal, Melville Irrigation, Abraham Irrigation and Deseret Irrigation Companies, which collectively are referred to as the DMAD Companies, and the Central Utah Water Company. A preliminary estimate of the portion of each company that would be purchased, and the corresponding water yield from each, is presented in Table 3-1.

TABLE 3-1

IPP SHARES OF EXISTING WATER COMPANIES

<u>Company</u>	<u>IPP Shares</u>	<u>% Ownership</u>	<u>Firm Yield Acre-Feet</u>
Delta*	5,565	20	8,160
Melville*	1,700	18.6	4,590
Abraham*	4,810	19.2	4,410
Deseret*	8,000	20	7,840
Central Utah	30,166	85	14,500
Total			39,500

*Includes groundwater obtained from wells owned collectively by the DMAD companies.

The DMAD companies obtain water from the Sevier River and from collectively owned groundwater rights. The companies serve agricultural lands near Delta.

In 1956 the DMAD companies filed applications for groundwater rights and drilled eight large capacity wells (DMAD wells) which feed directly into the Sevier River. As shareholders in each of the companies, IPP would be entitled to its pro rata share of the well water from the DMAD wells. The wells are presently used as supplemental water, that is to firm up surface water supplies and to enhance water quality.

The Central Utah Water Company obtains water from the Sevier River and serves lands in the Lynndyl-Leamington area and portions of the northern Pavant Valley. The company proposes selling water to IPP which it presently delivers to the northern Pavant Valley, and that water which is normally consumed by substantial canal and reservoir losses. These losses presently result from the use of the rather inefficient Central Utah Canal, which conveys water to the Pavant Valley, and the Fool Creek Reservoirs. The balance of water accruing to IPP from Central Utah Water Company shares would come from Lynndyl-Leamington service areas.

Table 3-1 identifies the firm water yield which accrues to the shares IPP would purchase from each company. On the average, these shares would accrue rights to water in excess of IPP's requirements. This excess water would initially be stored in the

existing surface water reservoirs to assure plant operation in low water availability years. The excess water, which would accrue over and above the Project's water demand and storage requirements in any year, would be made available for use in the areas from which the water was originally purchased.

3.2 GROUNDWATER

Based upon the firm water yield analysis, the Project would require 5500 acre-feet of sole-supply groundwater rights. This groundwater would be in addition to the portion of the DMAD supplemental wells obtained by ownership of DMAD companies' shares.

The Project would purchase the groundwater rights in either the Delta or the Lynndyl-Leamington areas, and transfer the location of the wells to or near the plant site.

3.3 CONVEYANCE

The conveyance system for diversion and transport of the water from the Sevier River would consist of an intake and pumping station and pipelines.

Except for two fire protection and emergency storage water tanks of 8 million gallons total capacity at the plant site, no additional water storage facilities are proposed.

The intake and pumping station, shown in Figure AL13, would be located on the west bank of the existing DMAD Reservoir which is located on BLM land approximately 6 miles northeast of Delta. About 10 acres of land would be required for the pumping station and related facilities.

The improvements will consist of a concrete lined approach channel, pump house, and electrical substation.

The approach channel would be excavated into the existing reservoir to allow diversion of river flow even if the reservoir is empty. Additional improvements to the existing reservoir or existing water control structures are not proposed.

The pump house would contain all pumps, valves, and controls necessary to pump water at flow rates to meet the generating station requirements up to a maximum of 74 cubic feet per second (cfs). The facility would normally be operated remotely from the generating station.

Water would be conveyed through two 42-inch diameter pipelines west and northerly across BLM land about 11.2 miles to the plant site. The pipelines, buried to a depth of 4 feet, would occupy 11.2 miles of 100-foot-wide common right-of-way.

SECTION 4.0

TRANSPORTATION SYSTEM

The transportation system would include construction and maintenance of new roads and railroad spurs to provide access and transportation during construction and operation of the plant.

4.1 NEW ROADS

New roads would be constructed to provide access on the plant site to the water supply intake and pumping station, and along lineal facilities such as power transmission lines, utility corridors, and water pipelines. Typical cross sections for the roads are shown in Figures A23 and AL28. A summary of the requirements for new roads in the primary Project area (in the vicinity of the generating station) is shown in Table 4-1. This summary does not include the requirements for the power transmission system roads which are listed in Section 5.0, Power Transmission System.

TABLE 4-1
NEW ROADS IN THE PRIMARY PROJECT AREA

<u>Component</u>	<u>Length In Miles (a)</u>	<u>Type of Road (b)</u>	<u>Acres Occupied</u>
Plant access road	0.6	Primary access road	7
Plant access road	5.8	Secondary access road	70
Water supply intake and pumping station access	0.8	Secondary access road (c)	8
Water supply pipeline access	8.3	Unpaved access road (c)	80
Ash haul roads at plant site	2.5	Ash disposal haul road	30
Ash haul roads at plant site	3.2	Unpaved access road	40

(a) The length includes mileage inside other rights-of-way.

(b) Shown on Figure A23.

(c) Also shown on Figure AL28.

4.2 RAILROAD SPURS

A new railroad spur, about 10 miles in length, would be constructed from the Union Pacific Railroad mainline near Lynndyl, Utah, to the plant site primarily to transport coal and lime during operation of the plant. However, early construction of the spur will allow for delivery of materials and equipment to the site during construction. Within the plant site, about 7.2 miles of additional trackage for unloading loops, sidings, and spur lines would be constructed. The alignments for the new railroad spurs are shown in Figures AL4 and AL5.

4.2.1 ROUTE

The off-site railroad spur would be constructed within a 100 foot width right-of-way crossing BLM and private lands. The present land ownership of the route right-of-way is shown in Table 4-2.

TABLE 4-2

PRESENT LAND OWNERSHIP OF PRIMARY ROUTE
COAL TRANSPORTATION SYSTEM

<u>Land Ownership</u>	<u>Line Miles</u>	<u>Acres @ 100 Ft. R/W Width</u>	<u>Percent of Total Line Mile and Acreage</u>
Bureau of Land Management	7.0	85	69.3
State of Utah	1.0	12	9.9
Private Lands	<u>2.1</u>	<u>25</u>	<u>20.8</u>
Total	10.1	122	100.0

4.2.2 CONSTRUCTION

Approximately 161,000 cubic yards of crushed rock and sub-ballast material would be required to support the track structure of the proposed railroad spurs. Local subgrade material would be used to construct all embankments. Fencing would be provided along the right-of-way where there are potential hazards to humans, livestock, or wildlife. Livestock and animal undercrossings will be provided as necessary. Drainage structures would also be provided as necessary.

4.3 OPERATION

Coal would be delivered to the plant site by unit trains. Four 84-car unit trains per day would be required to transport the coal from the mining areas to the plant site. The average one-way haul distance from the Wasatch-Book Cliffs area is approximately 165 miles, of which 155 miles would be over the existing Union Pacific and Denver and Rio Grande Western trackage, and/or the Utah Railway trackage. The trains would operate five to six days per week, depending on demand. The turn-around time for each train would be approximately 24 hours.

Locomotives for the unit trains would be diesel-electric powered units weighing 280,000 pounds each. Open gondola type cars of 100-ton capacity would be used. Each mine would provide its own transportation system to the commercial railroad.

SECTION 5.0

POWER TRANSMISSION SYSTEM

The proposed IPP power transmission system consists of two subsystems; the Southern California System and the Utah System. The Southern California Transmission System would transmit power from the proposed plant site to the Victorville Converter Station, in California, where the power would be distributed to the California participants. The Utah Transmission System would deliver power to Utah and Nevada participants. General locations of the preferred and alternative transmission line routes are shown in Figure GL28.

5.1 SOUTHERN CALIFORNIA TRANSMISSION SYSTEM

5.1.1 ROUTING

Two 500-kV d-c transmission lines would be constructed from the proposed generating station to a new converter station to be located at Victorville, California, as shown in Figures GL28, GL34 through GL39, and GL50. Existing facilities would be used to distribute power from the Victorville Converter Station to the Southern California participants.

The right-of-way requirements and land status for the Southern California Transmission System are listed in Table 5-1. Approximately 21,753 acres total would be required. Table 5-2 lists land status by line segments.

TABLE 5-1

TRANSMISSION LINE RIGHT-OF-WAY NEEDS
 LAND STATUS - SOUTHERN CALIFORNIA TRANSMISSION SYSTEM
 PREFERRED ROUTE

Transmission Line	Total Length (Miles)	Land Status - Miles				Approximate Acres
		BLM	Forest Service	State*	Private	
Line I	458.7	413.1	--	18.0	27.6	10,128
Line II	452.6	337.3	11.3	21.1	82.9	10,476
Common Route	37.4	35.5	--	--	1.9	1,149
TOTAL	948.7	785.9	11.3	39.1	112.4	21,753

*States of Utah and California

TABLE 5-2

LAND STATUS OF RIGHT-OF-WAY
SOUTHERN CALIFORNIA TRANSMISSION SYSTEM
PREFERRED ROUTE

(Includes the Utah Transmission System That is Within the Common Right-of-Way)

Line Segment	Total Miles Segment	Right-of-Way Width In Feet	Miles of Right-of-Way				County	Acres R/W Corridor Applied for By IPP
			Public Lands		Private			
			BLM	USFS	State			
<u>Lynndyl-Victorville Line I</u>								
1. Lynndyl to Little Drum Junction - One new +500 kV d-c bipolar line and one new 230 kV single circuit a-c line (2.3 miles on plant site not included)	21.2	275	16.6 (Ut)	--	0.5 (Ut)	4.1	21.2 Millard	707
2. Little Drum Junction to Dry Lake Junction -One new +500 kV d-c bipolar line	170.5	200	71.0 (Ut) 88.0 (Nev)	--	11.5 (Ut)	--	82.5 Millard 2.5 White Pine 85.5 Lincoln	4,134
3. Dry Lake Junction to Gypsum Junction-One new +500 kV d-c bipolar line	106.0	200	103.5 (Nev)	--	--	2.5	65.0 Lincoln 41.0 Clark	2,570
4. Gypsum Junction to El Dorado Junction -Two new +500 kV d-c bipolar lines (Adjacent to Navajo-McCullough Trans-mission Line Corridor	1.9 35.5	130 260	35.5 (Nev)	--	--	1.9	37.4 Clark	30 1,119
5. El Dorado Junction to Victorville Converter Station - One +500 kV d-c bipolar line (Adjacent to Boulder Transmission Line R/W)	161.0	200 130	26.0 (Nev) 108.0 (Ca) 108.0 (Ca) 87.6 (Ut) 253.0 (Nev)	--	6.0 (Ca) 6.0 (Ca) 0.5 (Ut) 11.5 (Nev)	2.0 19.0 29.5	27.0 Clark 134.0 San Bernardino	605 2,112
TOTAL - Line I	496.1							11,277

TABLE 5-2 (CONT'D)

Line Segment	Total Miles Segment	Right-of-Way Width In Feet	Miles of Right-of-Way					County	Acres R/W Corridor Applied for by IPP	
			Public Lands		Private					
			BLM	USFS	State					
<u>Lynndyl-Victorville Line II</u>										
1. Lynndyl to II-A-One new +500 kV d-c bipolar line (0.9 miles on plant site not included)-2.6 miles on common R/W with Lynndyl-Mona 345 kV a-c line 2	2.6 81.5	300 200	59.5 (Ut)	--	11.0 (Ut)	13.6	78.1 Millard 6.0 Beaver	95 1,976		
2. II-A to II-B-One new +500 kV d-c bipolar line	74.5	200	34.2 (Ut)	--	3.8 (Ut)	36.5	28.0 Beaver 46.5 Iron	1,807		
3. II-B to II-C-One new +500 kV d-c bipolar line	16.0	200	0.4 (Ut)	10.3 (Ut)	0.3 (Ut)	5.0	16.0 Washington	388		
4. II-C to Toquop Junction -One new +500 kV d-c bipolar line	42.5	200	27.5 (Ut) 13.0 (Nev)	1.0 (Ut)	1.0 (Ut)	--	29.5 Washington 13.0 Lincoln	1,031		
5. Toquop Junction to Gypsum Junction-One new +500 kV d-c bipolar line (Adjacent to Navajo-McCullough Transmission Line Corridor)	62.5	130	61.7 (Nev)	--	--	0.8	9.0 Lincoln 53.5 Clark	985		
6. Gypsum Junction to El Dorado Junction-Land requirements included in Lynndyl-Victorville Line I	--	--	--	--	--	--	--	--		
7. El Dorado Junction to Victorville Converter Station-One new +500 kV d-c bipolar line	173.0 452.6	200	27.0 (Nev) 114.0 (Ca)	--	5.0 (Ca)	27.0	27.0 Clark 146.0 San Bernardino	4,194		
TOTAL - Line II			121.6 (Ut) 101.7 (Nev) 114.0 (Ca)	11.3 (Ut)	16.1 (Ut)	82.9		10,476		

TABLE 5-2 (CONT'D)

<u>Line Segment</u>	<u>Total Right-of-Way Miles Segment</u>	<u>Right-of-Way Width In Feet</u>	<u>Miles of Right-of-Way</u>				<u>Acres R/W Corridor Applied for by IPP</u>
			<u>Public Lands</u>		<u>Private</u>		
			<u>BLM</u>	<u>USFS</u>	<u>State</u>	<u>County</u>	
Total-Southern California Transmission System	948.7	--	209.2 (Ut)	11.3 (Ut)	28.1 (Ut)	112.4	21,753
			354.7 (Nev)	--	-- (Nev)	--	
			222.0 (Ca)	--	11.0 (Ca)	--	

5.1.2 TRANSMISSION LINE SIZE AND DESIGN

Towers for the new d-c bipolar transmission lines would be freestanding lattice-type made of unpainted galvanized steel. Figure G20 depicts typical towers. These towers would support two overhead ground wires and two pairs of conductors. Each conductor would consist of a 1.8-inch diameter composite of aluminum wires over a steel wire core. The average span length would be approximately 1400 feet (four towers per mile).

5.1.3 ACCESS AND SERVICE ROADS

Access and service roads would require the use of approximately 1150 miles of existing and new roads. Because of proximity to other corridors, 700 miles of existing roads would be used. About 450 miles of new access roads would be constructed along the transmission line right-of-way. The new access roads would consist of a main road running the length of the right-of-way with stub roads providing access to each structure. In some cases, it would be necessary to locate new access roads outside the right-of-way due to geological, ecological, or topographical considerations. These conditions may be expected to exist over approximately 10 percent of the area where new roads are required, resulting in approximately 50 miles (50 foot right-of-way width), or 300 acres, of access roads outside the right-of-way.

Legal access would be obtained for roads connecting existing public roads or highways with the transmission line right-of-way at intervals not to exceed 10 miles. Permits for the use of existing roads or trails would be obtained wherever required. It is estimated that an additional 30 miles (50 foot right-of-way width), or 180 acres, of new roads would be required for access from existing roads and highways.

5.1.4 CONSTRUCTION PHASES AND ACTIVITIES

Preconstruction and construction activity would continue intermittently year round.

Prior to actual line construction, the route would be surveyed. Access roads would be cleared of vegetation only where necessary and wire let-down gates installed on all existing range and farm fences as required.

Land requirements for temporary construction facilities which would be located off the transmission line right-of-way are described below:

Project Offices--These offices would consist of trailers or rented facilities convenient to the transmission line right-of-way. The project office would require about 3 to 5 acres of land and would be moved several times during construction.

Field Offices and Reporting Yards--These offices would be housed in trailers located at sites in close proximity to the transmission line right-of-way. They would require about 2 acres of land at each site and would be spaced about 25 miles apart. They would be moved as line construction progresses.

Storage yards--These yards would be required for storage of transmission line materials and are frequently located with project and field offices and reporting yards. About 3 to 5 acres of additional land would be required for each yard.

Concrete Batch Plants--Portable concrete batch plants would be used where concrete from local ready-mix plants is not available. The batch plants would be set up every 10 to 15 miles where concrete is required and would be moved when concrete work is completed on a particular portion of the transmission line. Less than 1 acre of land would be required for each setup.

Some temporary construction facilities would require removal of vegetation, grading or leveling, compaction, placing crushed rock, fencing, and development of utilities. Existing sites would be used where possible.

Where required, new access roads would be the first in a sequence of construction activities. Actual line construction would follow. It would consist of the installation of footings, erecting towers, installation of insulators, stringing conductor, and grounding towers, where needed. The construction crews could be divided into several segments each working simultaneously along the line. No more than twenty persons would work on a tower site at any one time.

Water for dust control, concrete, and other construction needs would be obtained from existing sources along the right-of-way and transported to the work locations by water trucks. In all

cases, the necessary permits or permission from the owners of the water rights would be obtained.

Drinking water would be obtained from existing sources.

5.1.5 MAINTENANCE

Maintenance includes all operations needed to keep the lines and associated facilities in operation. Maintenance consists of periodic patrols by air (approximately 4 times per year) and an annual ground patrol. Emergency maintenance would be performed in the event of any line failure.

5.1.6 STATIONS

The IPP 345-kV a-c switchrack in the IPP switchyard would provide connections to four generator step-up banks, four 345-kV a-c ties to the d-c converter station, two 345-kV a-c transmission lines, one 230-kV a-c transmission line through a 345/230-kV autotransformer, and bus ties to two 345/46-kV autotransformers.

The IPP Converter Station would be located adjacent to the IPP generating plant. The station would have a total capacity of 1950 Mw. Two bipolar converter terminals of four series-connected 12-pulse bridges each would be utilized.

The Victorville Converter Station would be located adjacent to the existing Victorville Switching Station near Victorville, California, as shown on Figure DL4. This would be the western terminus of the two d-c transmission lines. The station would have a total capacity of 1950 Mw. Two bipolar converter terminals of four series-connected 12-pulse bridges each would be utilized.

5.2 UTAH TRANSMISSION SYSTEM

The Utah Transmission System would transmit power to the Utah and Nevada participants in the Project and includes construction of 95 miles of new single-circuit 345-kV a-c transmission line and 311.5 miles of new single-circuit 230-kV a-c transmission line. Existing facilities would be used to transmit power to Sigurd Substation and to distribute power from the Sigurd, Paragonah,

St. George, Mona (new), and Gonder Substations to these participants.

5.2.1 ROUTING

The proposed route for the Utah Transmission System from IPP to the Utah participants is shown in Figures GL28 through GL30, GL34 through GL36, and GL50, and consists of the following:

Two 345-kV a-c transmission lines constructed from the IPP-Lynnndyl site to Utah Power and Light Company's (UP&L's) proposed Nephi Power Plant near Nephi, Utah, or to UP&L's proposed Mona Substation near Mona, Utah. The termination point depends on the construction schedule of the Nephi Power Plant. If the plant is not constructed at the time IPP begins operation, the lines would go to the Mona Substation. They would interconnect with the existing or proposed UP&L transmission system at one of these points, permitting the transmission of power to many of the Utah participants.

One 230-kV a-c transmission line constructed from IPP 140.5 miles to the Gonder Substation near Ely, Nevada.

One 230-kV a-c transmission line from the Sigurd Substation to the Paragonah Substation near Parowan, Utah, then to the St. George Substation in St. George, Utah.

The right-of-way requirements and land status for the Utah Transmission System are listed in Table 5-3. A detailed listing by line segments of the right-of-way is shown in Table 5-4.

TABLE 5-3

TRANSMISSION LINE RIGHT-OF-WAY NEEDS
LAND STATUS - UTAH TRANSMISSION SYSTEM
PREFERRED ROUTE

<u>Transmission Line</u>	<u>Total Length (Miles)</u>	<u>Land Status - Miles</u>				<u>Approximate Acres</u>
		<u>BLM</u>	<u>Forest Service</u>	<u>State</u>	<u>Private</u>	
Lynndyl to Mona Substation						
Line 1	46.3	23.3	2.5	1.7	18.8	842
Line 2	43.9	20.9	2.5	1.7	18.8	799
Little Drum Junction to Gonder Substation						
	117.0	97.9	8.5	5.7	4.9	1560
Sigurd Substation to Paragonah Substation						
	92.5	44.0	6.1	8.1	34.3	1234
Paragonah Substation to St. George Substation						
	<u>78.5</u>	<u>23.3</u>	<u>24.2</u>	<u>2.6</u>	<u>28.4</u>	<u>1047</u>
TOTAL	378.2	209.4	43.8	19.8	105.2	5482

TABLE 5-4

LAND STATUS OF RIGHT-OF-WAY
UTAH TRANSMISSION SYSTEM
PREFERRED ROUTE

Line Segment	Total Miles Segment	Right-of-Way Width In Feet	Miles of Right-of-Way					County	Acres R/W Corridor Applied for by IPP
			Public Lands		Private				
			BLM	USFS	State	Private			
1. Lynndyl to Mona Sub-station-Two new 345 kV a-c lines-2,000 foot separation Line 1 (1.2 miles on plant site not included) Line 2 (2.6 miles on common R/W with Lynndyl-Victorville +500 kV d-c Line II and 1.0 miles on plant site not included)	46.3	150	23.3 (Ut)	2.5 (Ut)	1.7 (Ut)	18.8	19.8 Millard 26.5 Juab	842	
	43.9	150	20.9 (Ut)	2.5 (Ut)	1.7 (Ut)	18.8	17.4 Millard 26.5 Juab	799	
2. Little Drum Junction to Gonder Substation-One new 230 kV a-c line	117.0	110	56.6 (Ut) 41.3 (Nev)	8.5 (Nev)	5.7 (Ut)	4.9	64.5 Millard 52.5 White Pine	1,560	
3 Sigurd Substation to Paragonah Substation -One new 230 kV a-c line	92.5	110	44.0 (Ut)	6.1 (Ut)	8.1 (Ut)	34.3	25.0 Sevier 30.0 Piute 8.0 Garfield 29.5 Iron	1,234	
4. Paragonah Substation to St. George Substation -One new 230 kV a-c line	78.5	110	23.3 (Ut)	24.2 (Ut)	2.6 (Ut)	28.4	41.0 Iron 37.5 Washington	1,047	
TOTAL	378.2		168.1 (Ut) 41.3 (Nev)	35.3 (Ut) 8.5 (Nev)	19.8 (Ut)	105.2		5,482	

5.2.2 TRANSMISSION LINE SIZE AND DESIGN

Structures for the 345-kV a-c transmission line and the 230-kV a-c transmission line would be freestanding wood H-frames. Typical structures are shown in Figures 1.4.3-1 and 1.4.3-2. Suspension structures would comprise 85 percent and dead-end, 15 percent of the total number of structures. Approximately seven wood pole structures per mile would be required.

The 345-kV a-c structures would support two overhead ground wires and six conductors (three pairs). Each conductor consists of a 1-inch diameter composite of aluminum wires over a steel wire core. The 230-kV a-c structures would support three single conductors instead of three pairs of conductors.

5.2.3 ACCESS AND SERVICE ROADS

IPP proposes to construct approximately 190 miles of new access road along the proposed transmission line right-of-way. Approximately 320 miles of the Utah Transmission System would make use of existing transmission system roads with only spurs to the tower sites being required. The new roads would be constructed within the right-of-way unless terrain or soil conditions require modification. These conditions may be expected to exist over about 25 percent of the area where new roads are required resulting in 50 miles (50 foot right-of-way width), or 300 acres, of access roads outside the right-of-way.

Access to roads along the transmission line rights-of-way would be required from existing roads or highways at intervals not to exceed 10 miles. Permits would be obtained to use existing roads or trails. It is anticipated that about 15 miles (50 foot right-of-way width), or 90 acres, of new additional access roads to the transmission line right-of-way would be required for access to existing roads and highways.

5.2.4 CONSTRUCTION PHASES AND ACTIVITIES

Construction phases and activities for the Utah Transmission System would be the same as for the Southern California Transmission System except that no portable concrete batch plant would be required and wood pole structures would be used in place of steel towers.

5.2.5 MAINTENANCE

Maintenance would be the same as described for the Southern California Transmission System.

5.2.6 STATIONS

Two 345-kV a-c transmission lines would tie with the existing UP&L system at a new Mona Switching Station (to be constructed by UP&L) or UP&L's proposed Nephi Generating Station (if constructed). The 230-kV a-c transmission line would tie with the existing Mount Wheeler System at their Gonder Substation.

The Gonder 230-kV substation would include one 230-kV power circuit breaker (PCB) which would be installed for switching the new 230-kV IPP-Gonder Line. The new line would be terminated in the existing switchyard located near Ely, Nevada.

The Sigurd 230-kV substation would include two 230-kV PCBs which would be installed for switching the new 230-kV Sigurd-Paragonah Line. The new line would be terminated in the existing switchyard located near Sigurd, Utah.

The Paragonah 230-kV substation would include three 230-kV PCBs which would be installed for switching the new 230-kV Sigurd-Paragonah and Paragonah-St. George Lines. The new lines would be terminated in the existing switchyard located near Parowan, Utah.

The proposed St. George 230-kV substation located near the City of St. George, Utah, will terminate the new 230-kV Paragonah-St. George Line. Approximately 5 acres of private land will be required for the installation of a 230-kV PCB, 230/69-kV transformer bank, and associated equipment.

The two new 345-kV lines from IPP would interconnect with the existing or proposed UP&L transmission system, which in turn would transmit power to many of the Utah participants. The two lines will terminate at the Nephi Generating Station which UP&L proposes to construct approximately 16 miles southwest of Nephi, Utah. If the Nephi Generating Station is delayed or is not constructed, the two 345-kV lines will be terminated at a new Mona Substation which UP&L proposes to construct on approximately 40 acres of land about 6 miles north of Nephi, Utah.

The Nephi Generating Station 345-kV switchyard will include two 345-kV lines from IPP which would terminate in the double bus, breaker and one-half switchyard positions. Three 345-kV PCBs will be installed for switching the new lines.

The Mona 345-kV substation would include two 345-kV lines from IPP which would terminate in the double bus, breaker and one-half switchyard positions. Three 345-kV PCBs would be installed for switching the new lines.

5.3 MICROWAVE COMMUNICATION SYSTEM

The microwave system would provide communication channels for control and operation of terminal equipment and transmission lines, transmission line fault location, and for dispatching, scheduling, and maintenance purposes. The system will have a terminal station at each end of the Southern California Transmission System and a number of repeater stations located approximately 20 to 40 miles apart, depending on the line-of-sight distances required. The location of the stations are shown on Figure GL28.

5.3.1 TERMINAL STATIONS

Terminal stations would be at the IPP plant site and Victorville, California. The electronic equipment would be in the switchyard control buildings. Antennas and supporting structures would be located within the terminal stations.

5.3.2 REPEATER STATIONS

The Clear Lake Station would be located at an existing electronic site about 8 miles west of Clear Lake, Utah. The equipment would be housed in a prefabricated building. A tower, approximately 70 feet high, would be installed with four antennas. Existing access road and power would be utilized.

The Mineral Mountain Station would be located at an existing electronic site about 16 miles northeast of Milford, Utah. The equipment would be housed in a prefabricated building. A tower, approximately 70 feet high, would be installed with four antennas. Existing access road and power would be utilized.

The Lund Iron County Station would be located at an existing electronic site about 5 miles west of Latimer, Utah. The equipment would be housed in a prefabricated building. A tower, approximately 70 feet high, would be installed with four antennas. Existing access road and power would be utilized.

The Big Mountain Station would be located at an existing electronic site within the Dixie National Forest about 5 miles southeast of Enterprise, Utah. The equipment would be housed in a prefabricated building. A tower, approximately 70 feet high, would be installed with four antennas. Existing access road and power would be utilized.

Additional electronic equipment would be installed at existing DWP stations at Beaver Dam, Glendale, Apex Peak, Red Mountain, and Quartzite Electronic sites to handle the additional circuits required by the IPP system.

SECTION 6.0

UTILITIES

6.1 POWER LINE FOR PLANT SITE CONSTRUCTION POWER

The maximum power required for construction would be 5 Mw and would be provided from UP&L's present 46-kV system in the Delta area. Power would be delivered to the plant site via the early construction of one of the proposed 46-kV subtransmission lines adjacent to the water supply pipelines and patrol road as shown in Figure AL28.

6.2 PROJECT POWER DISTRIBUTION SYSTEM

Power for the water supply pumping station, to be located at the DMAD Reservoir, would be provided by two 46-kV subtransmission lines from the generating facility. The subtransmission lines would be placed in a common corridor with access roads and water pipelines. Figure AL28 shows the typical arrangement of the common corridor. There would be approximately eight poles per mile for each line.

6.3 PROJECT TELEPHONE SERVICE

It is anticipated that the Project telephone service would be provided by Continental Telephone Company of the West, the telephone company which serves the Delta area.

SECTION 7.0

COMMUNITY DEVELOPMENT

The Lynndyl Alternative Site is located within 25 miles of several communities, hereinafter referred to as the Delta-Lynndyl area, with a cumulative population in 1977 estimated to total in excess of 4900 people. These estimates were provided by the U. S. Bureau of the Census and Architects/Planners Alliance, Inc. of Salt Lake City. The largest of these communities is Delta, Utah, which is approximately 11 miles south of the plant site. Delta has a total population estimated by the Six-County Commissioners Organization to be approximately 2200 people in 1977 and has a well developed infrastructure, including the middle and high schools for West Millard County. In addition, Table 7-1 shows the population and the highway distance from the plant site to other nearby population centers.

TABLE 7-1

PROXIMITY OF POPULATION CENTERS TO PLANT SITE

<u>Population Center</u>	<u>Highway Distance From Site (Miles)</u>	<u>1977 Population*</u>
Eureka-Juab County	46	840
Fillmore-Millard County	48	3,340
Nephi-Juab County	46	4,660
Provo-Utah County	86	177,000
Salt Lake County	132	533,000

*Based on 1977 estimated population by the Bureau of Economic and Business Research, University of Utah, and the Six-County Commissioners Organization.

Since only a small portion of the work force necessary to construct the Project is present in the Delta-Lynndyl area, the majority of the construction work force will come from other parts of Utah or from outside the State of Utah.

Because of the proximity of the various population centers to the plant site, it is projected that a significant number of construction workers will commute to the Project daily or commute on a weekly basis without their families (i.e., they will live in the Delta-Lynndyl area in temporary housing during the week, but

commute on weekends to their permanent place of residence), minimizing the number of construction workers who will relocate with their families to the Delta-Lynndyl area. A high percentage of the permanent operation and maintenance work force, though, is projected to relocate to the Delta-Lynndyl area. Table 7-2 shows the number of daily commuters, weekly commuters, and relocatees to the Delta-Lynndyl area projected for January 1 of each year from 1981 through 1990 and includes both the construction work force and the plant operation and maintenance work force.

TABLE 7-2

PROJECTED WORK FORCE LIVING PATTERN
DELTA-LYNNDYL AREA
POWER PLANT CONSTRUCTION AND OPERATION

	<u>1/1981</u>	<u>1/1982</u>	<u>1/1983</u>	<u>1/1984</u>	<u>1/1985</u>
Daily Commuters	0	54	130 *	468	871
Weekly Commuters	0	8	37	231	554
Relocatees	0	68	98	301	575
	<u>1/1986</u>	<u>1/1987</u>	<u>1/1988</u>	<u>1/1989</u>	<u>1/1990*</u>
Daily Commuters	1145	1086	896	633	292
Weekly Commuters	754	661	502	278	27
Relocatees	781	793	707	544	311

*Does not include construction workers who may still be present.

The data presented in Table 7-2 are based upon the assumption that a portion of the workers that decide to relocate, instead of commuting daily or weekly, will choose to reside in locations other than the Delta-Lynndyl area, such as Fillmore in Millard County and Nephi and Eureka in Juab County, and then commute daily to the plant. With the exception of the community of Nephi, the number of workers that will relocate in communities other than the Delta-Lynndyl area is projected to be small and in the range considered to be within normal growth. Nephi, being located approximately 46 miles from the plant site, 40 miles from Provo, and 86 miles from Salt Lake City, is anticipated to attract 123 relocatees in 1986 at the peak of construction. This is primarily due to Nephi's attractive proximity to the major population centers of Salt Lake City and Provo, while at the same time, being within a one-hour drive of the site. Nephi's population in 1977 was estimated to be 4660 people; therefore, the impact of the new relocatees is not considered significant

and the major impacted area would be the Delta-Lynndyl area in Millard County.

7.1 PROPOSED DEVELOPMENT

Proponents of the Project and officials in Millard County concur that the various communities in the Delta-Lynndyl area should be expanded to accommodate the increase in population resulting from the construction and operation of IPP at the Lynndyl Alternative Site. Estimates indicate that at the peak of construction, the projected population of 6330 people in the Delta-Lynndyl area in 1986 could reach a total of 10,600 people with IPP, including primary and secondary workers and their families.

In March of 1978, the Millard County Council of Governments (COG) was reactivated through a joint effort of the Millard County Commissioners and IPP. Membership in the COG consists of the mayors of the county's ten incorporated cities and the three county commissioners. This organization was formed for the purpose of formally coordinating matters of mutual interest to the various towns and unincorporated areas within Millard County.

In addition, in July of 1978, the COG, in coordination with IPP and the State of Utah Department of Community Affairs, established a Citizen's Advisory Committee to advise the COG on items relating to IPP and to the growth resulting from IPP. This Citizen's Advisory Committee will bring together IPP and public officials and the general public in an "open" forum which will serve to advise the COG on matters requiring input for county or city approval. The Citizen's Advisory Committee will be a vital communication link between IPP and the citizens of Millard County. The committee will establish working procedures that will assure that the communities and IPP are involved in defining mutually acceptable solutions to many of the challenges that will occur during the construction and operation of IPP.

In July 1978, the COG, through the Millard County Commissioners, applied to the Community Impact Board, administered through the Utah State Department of Community Affairs, for a grant to fund a full-time planner and part-time technical staff for Millard County and the cities within Millard County. In October of 1978, the Community Impact Board approved Millard County's request for funds and subsequently hired a full-time County/City Planner effective February 1, 1979. This planning staff, with the assistance of IPP, the Six-County Commissioners Organization, and the Department of Community Affairs, will work to update the

various city and county master plans and the various zoning, subdivision, and other ordinances to make possible planned and orderly development in Millard County. The Citizen's Advisory Committee will also serve as advisors to this planning effort by developing the basic goals and policies for Millard County that will be incorporated in the revised master plans. The goals and policies should be completed by June 1979.

In recognizing the importance of updating the various city and county master plans and ordinances to provide for planned and orderly development, the Juab County Commissioners have also applied for a grant from the Community Impact Board to obtain the services of a planner for this purpose.

7.2 COMMUNITY DEVELOPMENT PLAN

Joint planning efforts between IPP and Millard County have been divided into the following four phases:

- I - Preliminary Studies
- II - Conceptual Planning
- III - Final Design
- IV - Community Expansion

Figure L3 details the planning effort.

As part of IPP's mitigation plan, IPP has assigned a representative of the Project to the Delta-Lynndyl area as a liaison between IPP and Millard County residents. This representative is a local resident who serves a variety of functions, including to: 1) help monitor local attitudes related to the proposed Project, 2) apprise local residents of the Project and its progress, and 3) relate local concerns directly to IPP to ensure that these concerns are adequately considered in the Project's development. This representative will serve as a Project coordinator and participate on the Citizen's Advisory Committee to deal with common area problems.

IPP has, as part of its mitigation plan, assigned an official of the Project to coordinate the community planning activities of the various cities and the County by providing assistance to local officials in an effort to help assure that their area will have planned and orderly growth resulting from IPP. This official of the Project meets regularly with local and state officials, attends the COG and Citizen Advisory Committee

meetings, and works closely with the newly appointed County/City Planner.

In addition, IPP has made available to state and local officials the results of a social and economic analysis of the Project that will be used in their planning for the growth resulting from the Project.

In order to reduce the burden to the local area hospitals and medical services, IPP will provide, at the plant site, an emergency medical facility and staff during the construction period. Such medical services will be used to handle construction site accidents. If necessary, patients can then be transported to nearby major population centers for further medical care if local facilities are not available.

7.3 FINANCING

Out-of-state, private utilities, and Rural Electric Cooperatives in IPP are required by Section 11-13-25, Utah Code Annotated 1953, as enacted by Chapter 14, Laws of Utah, to make payments in-lieu of sales, use, and ad valorem taxes normally charged to private utilities.

As part of its proposed mitigation plan, IPP has agreed to provide financial assistance for capital investment by prepaying sales and use taxes as permitted by the State of Utah law to the extent where such payments would go to the funding of roads and schools in Millard and Juab Counties required as a result of IPP. IPP has also agreed to participate in Special Service Districts as provided under Utah law. In addition, numerous state and federal assistance loans and grants are available and their availability will be explored throughout the Conceptual Planning phase. IPP is willing to identify state and federal funding sources and programs to be used to help finance impact mitigation. IPP is also willing to provide technical assistance to Millard County and any of its cities and towns in applying for such governmental funds by establishing a team effort with local agencies for the purpose of securing approvals of such applications. In any case, it is estimated that the total cost for the expansion of the communities in Millard County would be well within the additional bonding capacity that Millard County would accrue if the Project is approved.

7.4 IMPACT MONITORING

To allow the timely identification of the actual needs for IPP related mitigation, IPP is willing to support and participate in an impact monitoring program. Such a program would include impact data collection, analysis, reporting, and assessment of the following types of impacts: 1) construction work force commuting and relocation patterns, 2) housing changes and requirements, 3) family and secondary worker multipliers, and 4) public facilities and services.

SECTION 8.0

CONSTRUCTION AND PERMANENT WORK FORCE

Construction and operation of the Project would require employment for the following Project components: generating station complex, coal transportation, transmission and communication systems including the d-c converter station, and the lime supply. Personnel would most likely live near their work areas. Most of the workers would be recruited from Utah, if possible. During peak construction, it is estimated that a total of 2950 employees would be needed. Annual peak employment by years is shown in Table 8-1.

TABLE 8-1

ESTIMATED ANNUAL PEAK EMPLOYMENT BY YEAR (CONSTRUCTION)

Year	Peak Number Employed		
	Generating Station	Communication Sites and Transmission Lines	D-C Converter Station
1981	80	0	55
1982	160	0	88
1983	835	130	332
1984	1700	538	412
1985	2500	804	262
1986	2520	326	164
1987	2230	523	364
1988	1690	525	414
1989	905	0	94
1990	10	0	0

8.1 GENERATING STATION

Estimated peak direct construction employment at the generating station complex, including the construction of the water conveyance, pumping facilities, and railroad spur line, would reach 2520 during the construction phase. The various trade unions in Utah estimate that up to 70 percent of the manual labor force and 30 to 40 percent of the non-manual labor force could be recruited from Utah's labor pool. A total of 630 operators, including the coal haul railroad car maintenance force, is anticipated to be required when the plant is in full operation as

shown in Table 8-2. The operation and maintenance work force required for the railroad to haul the coal to the plant site will be provided by the railroad companies. IPP has pledged its support to work with various trade schools and the Utah State Employment Security Office in training necessary recruits through local schools in order to aid in providing the necessary labor force from the Utah labor pool where possible. A breakdown of projected construction and operation work force by crafts and by quarter years for the generating station complex is shown in Table 8-3.

TABLE 8-2
ESTIMATED ANNUAL PEAK EMPLOYMENT BY YEAR
(OPERATIONS)

<u>Year</u>	<u>Peak Number Employed</u>		
	<u>Generating Station</u>	<u>Communication Sites and Transmission Lines</u>	<u>D-C Converter Station</u>
1985	135	0	5
1986	270	0	20
1987	355	4	20
1988	510	5	30
1989	630	7	39
1990	630	7	39

TABLE 8-3
PROJECTED LABOR FORCE
GENERATING STATION COMPLEX

	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9
CONSTRUCTION																		
Boilermakers									40	80	100	120	145	225	350	400	450	460
Brickmakers & Cement Masons								2	10	30	30	35	40	50	50	40	40	35
Carpenters	1			3	5	5	10	20	20	25	50	75	100	150	175	175	180	180
Electricians					2	10	10	40	60	90	110	120	170	200	250	280	325	350
Ironworkers					2	5	10	20	40	65	80	100	150	170	180	200	220	240
Laborers	5	8	15	15	15	15	60	100	140	150	200	200	210	220	245	240	240	240
Millwrights											5	10	15	20	30	40	60	80
Operating Engrg.	11	62	97	89	75	84	90	130	150	170	155	150	160	160	140	140	120	105
Painters									5	5	10	15	15	15	15	20	20	20
Pipefitters							30	35	50	110	130	230	240	270	310	340	410	470
Sheet Metal Workers									5	5	5	5	5	10	20	30	40	40
Teamsters	1	2	2	3	1	1	5	8	10	15	15	20	30	30	35	35	35	40
Non-Manuals	3	8	15	20	30	40	50	60	70	90	110	150	170	180	200	220	240	240
SUBTOTAL	20	80	130	130	130	160	265	415	600	835	1000	1230	1450	1700	2000	2150	2370	2500
OPERATION AND MAINTENANCE																		
TOTAL	20	80	130	130	130	160	265	415	600	835	1000	1230	1450	1700	2000	2150	2390	2635
CONSTRUCTION																		
Boilermakers	470	450	450	440	440	425	400	390	360	290	200	180	150	110	20			
Brickmakers & Cement Masons	30	25	20	20	15	10	10	10	10	10	10	5	5					
Carpenters	185	180	180	165	140	120	100	90	90	80	80	70	60	50	30	15		
Electricians	160	350	330	310	300	275	270	250	220	200	180	170	150	120	60	30		
Ironworkers	235	230	200	190	180	175	160	140	110	90	90	75	50	40	20	5		
Laborers	245	245	235	235	220	210	205	190	170	150	110	100	90	50	30	0		
Millwrights	85	90	90	90	85	35	80	75	70	55	45	40	40	40	20	10	5	
Operating Engrg.	95	90	95	90	85	85	85	75	75	65	60	60	55	50	35	10		
Painters	20	20	20	20	15	15	15	10	10	10	5	5						
Pipefitters	490	500	490	470	450	430	400	380	340	300	240	230	180	60	40			
Sheet Metal Workers	45	55	55	50	50	50	45	40	40	40	30	25	15	10				
Teamsters	40	35	35	30	30	30	30	30	25	20	15	15	10	5	5			
Non-Manuals	220	220	220	220	220	210	200	190	170	150	120	110	95	75	50	20	5	
SUBTOTAL	2520	2490	2420	2330	2230	2120	2000	1870	1690	1460	1185	1085	905	610	310	90	10	
OPERATION AND MAINTENANCE																		
TOTAL	160	220	270	270	310	310	340	355	415	415	510	510	550	580	620	630	630	630
TOTAL	2680	2710	2690	2600	2540	2430	2340	2225	2105	1875	1695	1595	1455	1190	930	720	640	630

Note: Month "0" is commercial operation of first unit.

8.2 TRANSMISSION AND COMMUNICATION SYSTEMS

The transmission lines would be constructed in several segments and the workers would move along the particular segment. Existing communities would provide housing in commercial rental units, travel trailers, or mobile homes. Units would be individually owned or rented. Where commercial lodging is unavailable within a reasonable distance from the construction site, the contractor would be required by IPP to provide camps to accommodate the workers. These camps would consist of graded areas equipped with laundry, bath houses, and sewage treatment facilities. It is expected that each site would be on land leased from private landholders. The work force to construct the Southern California Transmission System is shown in Table 8-4, and the work force to construct the Utah Transmission System is shown in Table 8-5.

Construction forces for the Victorville Converter Station, as well as most of the 39 employees associated with the operation and maintenance of the Victorville Converter Station, would reside in Victorville, California. The work force is shown in Table 8-6.

The maximum number of construction workers at any time on the transmission and communication systems is estimated to be 986 and to occur 15 months prior to commercial operation of the first unit.

TABLE 8-4
SOUTHERN CALIFORNIA TRANSMISSION SYSTEM
CONSTRUCTION LABOR FORCE

		Month																							
		-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	-6	-3	0	3	6	9	12	15	18	21	24	27	
IPP to Victorville-Line 1, Segment A																									
Manual	0	13	51	146	146	179	227	181	181	86	9	0													
Non-Manual	0	10	14	17	17	18	21	17	17	14	9	0													
TOTAL	0	23	65	163	163	197	248	198	198	100	18	0													
IPP to Victorville-Line 1, Segment B																									
Manual	0	13	51	146	146	179	227	181	181	86	9	0													
Non-Manual	0	10	14	17	17	18	21	17	17	14	9	0													
TOTAL	0	23	65	163	163	197	248	198	198	100	18	0													
IPP to Victorville-Line 2, Segment A																									
Manual														0	13	146	146	146	223	181	181	181	73	0	
Non-Manual														0	10	17	17	17	22	17	17	17	13	0	
TOTAL														0	23	163	163	163	245	198	198	198	86	0	
IPP to Victorville-Line 2, Segment B																									
Manual														0	13	146	146	146	223	181	181	181	73	0	
Non-Manual														0	10	17	17	17	22	17	17	17	13	0	
TOTAL														0	23	163	163	163	245	198	198	198	86	0	
GRAND TOTAL		0	46	130	326	326	394	496	396	396	200	36	0	0	46	326	326	326	490	396	396	396	172	0	

Note: Month "0" is commercial operation of first unit.

TABLE 8-5
UTAH TRANSMISSION SYSTEM
CONSTRUCTION LABOR FORCE

		-24	-21	-18	-15	-12	-9	Month -6	-3	0	3	6	9	12	15	18	21	24	27
IPP to Gonder and IPP to Nephi/Mona - Line 1																			
Manual		0	11	105	182	188	186	86	9	0									
Non-Manual		0	10	17	22	22	21	14	9	0									
TOTAL		0	21	122	204	210	207	100	18	0									
Sigurd to Paragonah to St. George																			
Manual		0	11	105	182	188	186	86	9	0									
Non-Manual		0	10	17	22	22	21	14	9	0									
TOTAL		0	21	122	204	210	207	100	18	0									
IPP to Nephi/Mona Line 2																			
Manual												0	8	27	71	117	98	52	0
Non Manual												0	2	6	8	12	8	6	0
TOTAL												0	10	33	79	129	106	58	0
GRAND TOTAL		0	42	244	408	420	414	200	36	0	0	0	10	33	79	129	106	58	0

Note: Month "0" is commercial operation of first unit.

TABLE 8-6
SOUTHERN CALIFORNIA TRANSMISSION SYSTEM STATION
CONSTRUCTION LABOR FORCE

	-57	-54	-51	-48	-45	-42	Month				-33	-30	-27	-24	-21	-18	-15	-12
Victorville Converter Station D-C Terminal																		
Electrical Workers	30	30	30	30	30	30	50	50	120	120	120	200	200	200	200	200	120	120
Others	20	20	20	50	50	50	100	100	200	200	200	200	50	50	50	50	50	50
Non-Manual	5	5	5	8	8	8	10	10	12	12	12	12	12	12	12	12	12	12
TOTAL	55	55	55	88	88	88	160	160	332	332	412	262	262	262	262	182	182	182
Victorville Converter Station D-C Terminal																		
Electrical Workers	120	120	100	100	50	30	50	50	150	200	200	200	200	100	50	30	30	30
Others	30	30	30	30	50	50	100	200	200	200	100	50	50	30	30	30	30	30
Non-Manual	12	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
TOTAL	162	164	144	144	114	94	164	264	364	414	314	264	144	94	74	74	74	74

Note: Month "0" is commercial operation of first unit.

8.3 LIME SUPPLY AND TRANSPORTATION SYSTEM

The U.S. Lime Division of the Flintkote Company would be able to supply the necessary lime for the Project from its present facilities near the town of Grantsville, Utah. Flintkote would require between 12 and 14 additional employees to mine, process, and deliver the Project's needs. The additional plant personnel would come from the relatively large local labor pool in the Salt Lake City area.

SECTION 9.0

ENVIRONMENTAL MONITORING

9.1 METEOROLOGICAL MONITORING

IPP proposes to continually monitor meteorological conditions from a meteorological tower located near the plant site. Meteorological conditions to be monitored would consist of wind speed and direction, and air temperatures at different elevations.

9.2 STACK EMISSION MONITORING

A flue gas monitoring system would continuously sample plant stack emissions. Monitoring instruments would be capable of recording SO₂, NO_x, Oxygen (O₂) concentrations, and opacity. Opacity measurements would aid in determining the visibility of stack emissions. Oxygen measurements would provide a mechanism for controlling boiler firing and achieving optimum combustion conditions.

9.3 WATER QUALITY MONITORING

Water quality for plant use would be monitored throughout the operational period of the Project. Additionally, observation wells into the near surface water table in the proximity of the solid waste and evaporation pond areas would be monitored during the operational period of the Project.

SECTION 10.0

DECOMMISSIONING

The continued operation of any or all parts of the Project at the end of its estimated life of 35 years per unit would depend upon the needs of the participants, the relationship to other available energy sources, environmental impacts, economics, and technical viability of the many Project systems at that time.

Because the known coal reserves in the region far exceed those needed during the estimated life of the Project, the assumption is that the Project facilities would be maintained, repaired, or replaced to extend the overall useful life beyond the 35 years.

As any or all of the Project systems could reach a point where they would no longer serve a useful purpose for IPP or other related projects, the facilities would be abandoned or removed in accordance with the laws and regulations existing at that time. Restoration of disturbed areas would also be done in coordination with governmental agencies.

Disposition of the power transmission system at the conclusion of the Project cannot be determined with any certainty. With the exception of the tower footings, which would not likely be removed, the transmission lines could be dismantled, if no longer in service, and the land permitted to return to its previous condition.

SECTION 11.0

LIST OF REFERENCES

All references listed in this Section are on file in the Project Engineer's office at the following address:

Mr. James H. Anthony, Project Engineer
Intermountain Power Project
Room 943, General Office Building
Department of Water and Power
Post Office Box 111
Los Angeles, California 90051
Telephone Number: (213) 481-5352

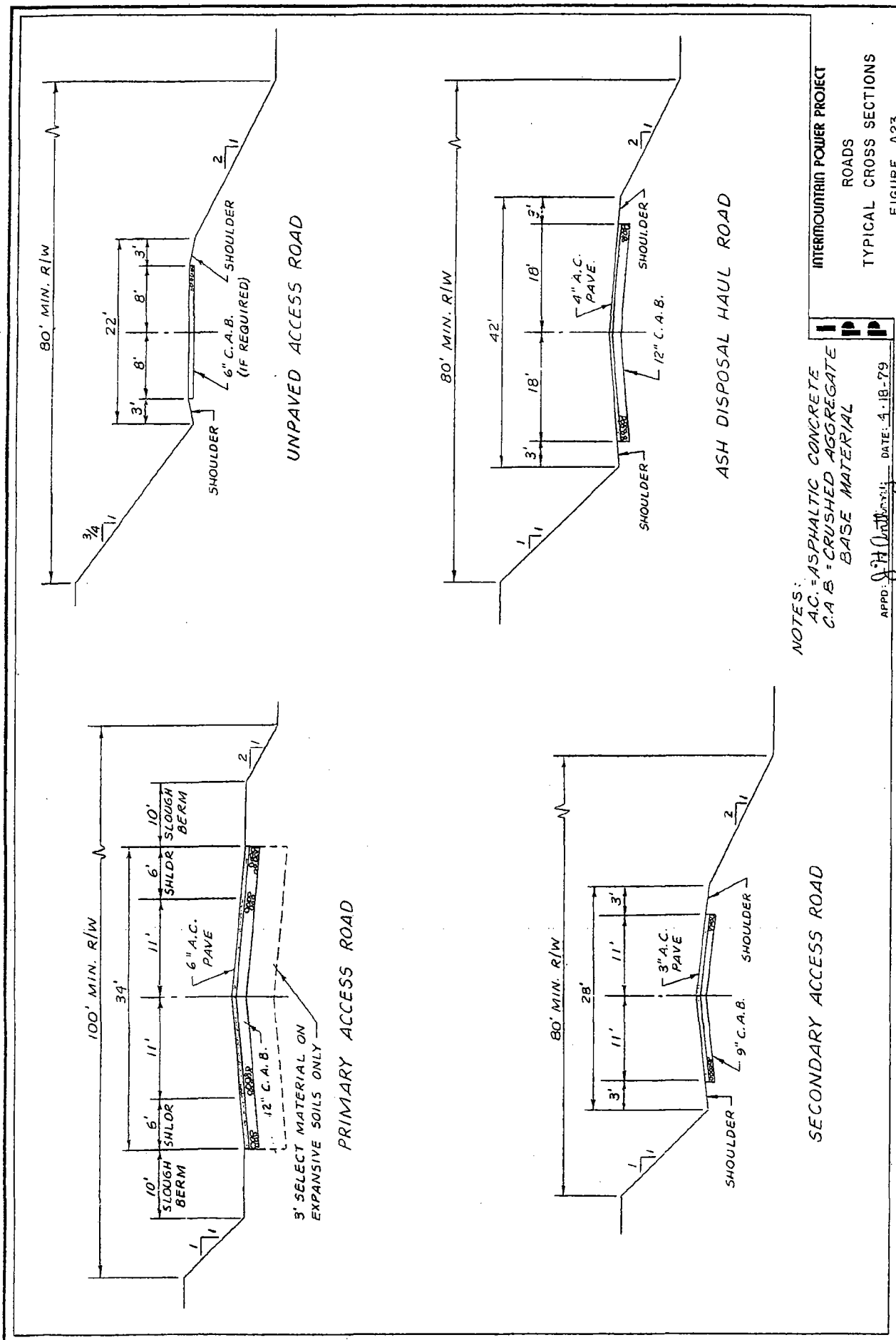
1. Architects/Planners Alliance, Inc., "Socioeconomic Analysis - Lynndyl Alternative Site", January 1979.
2. H. E. Cramer Company, Final Report, "Assessment of the Air Quality Impact of Emissions from the Proposed IPP Power Plant at the Primary and Six Alternate Sites", March 1978.
3. H. E. Cramer Company, Draft Report, "Calculated Air Quality Impact of the Emissions from the Proposed IPP Power Plant at the Lynndyl Site", July 1978.
4. Dames and Moore, "Phase I Preliminary Geotechnical Studies, Proposed Power Plant, Lower Sevier River Area, Utah, for Intermountain Power Project", May 1978.
5. Dames and Moore, "Phase II Preliminary Geotechnical Studies, Proposed Power Plant, Lower Sevier River Area, Utah, for Intermountain Power Project", July 1978.
6. Dames and Moore, "Site Evaluation Investigation, Lynndyl Alternative Site, Millard County, Utah, for the Intermountain Power Project", April 1979.
7. Don D. Fowler, Lonnie Pippin and Elizabeth Budy, Desert Research Institute, "Class II Cultural Resources Field Sampling Inventory Along Proposed IPP Transmission Line Corridors, Utah-Nevada", November 1978.
8. IPP, "Hydrology Report for the Lynndyl Site", December 1978.

9. Dr. Wade E. Miller and Mr. Samuel K. Webb,
"Paleontological Literature Survey of the Lynndyl Site
and Transmission System (Intermountain Power Project)",
August 1978.
10. Stanley L. Welsh, Intermountain Power Project,
"Threatened and Endangered Plant Species Baseline
Study", August 1978.

SECTION 12.0

FIGURES

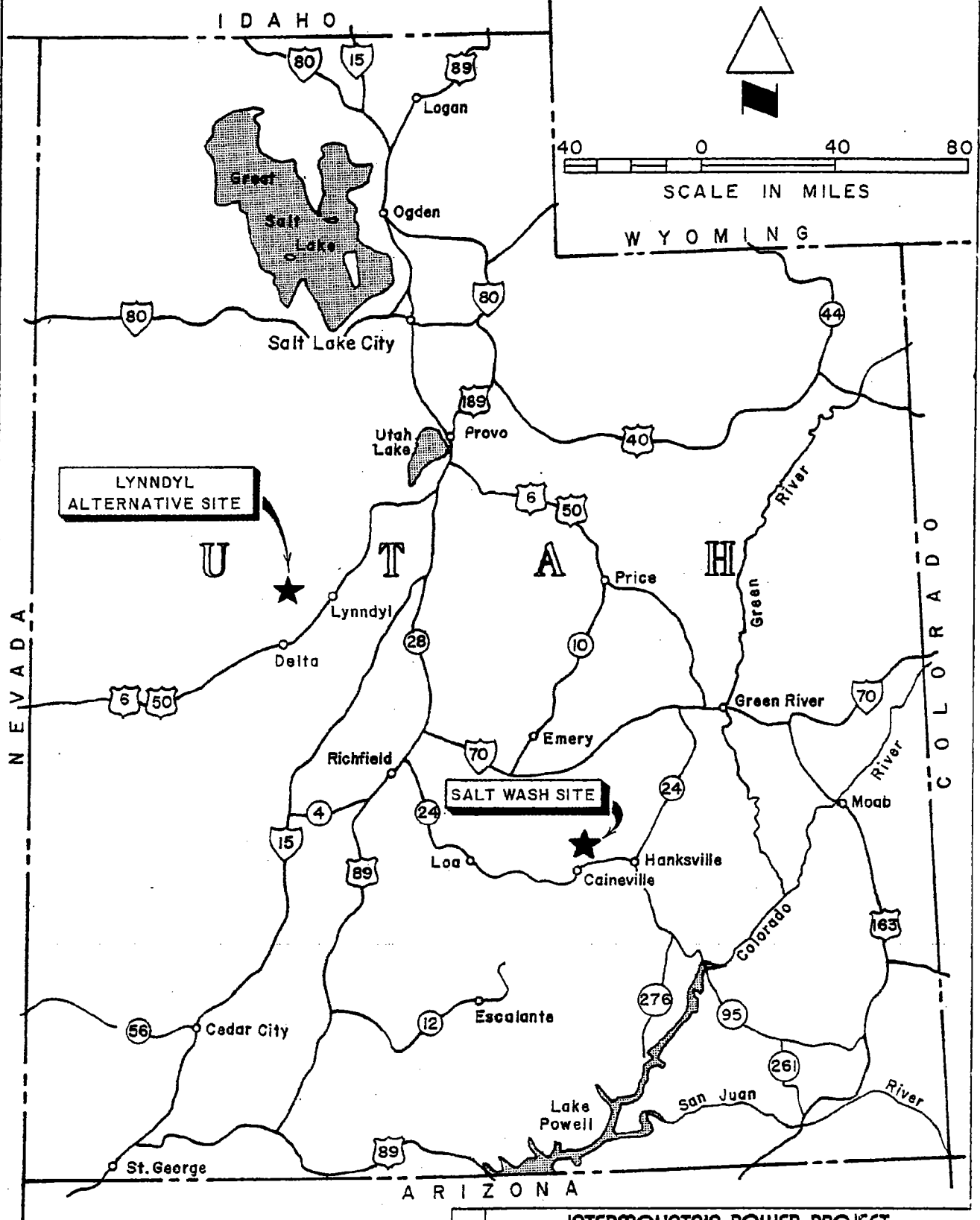
A23	Roads, Typical Cross Sections
AL1	Location Map
AL2	Coal Source Areas
AL4	General Plan
AL5	Site Plan
AL7	Solid Waste Disposal Area
AL8	Evaporation Ponds
AL9	Project Water Budget
AL13	Plan, Intake & Pumping Station
AL28	Typical Sections, Utility Corridor
AL29	Borrow Sites
BL1	General Arrangement
DL4	Equipment Layout, Victorville Converter Sta. and Switching Sta.
EL3	Main Plant, Plant West Elevation
G20	Typical +500-kV d-c Bipolar Freestanding Suspension Tower
GL28	Index Map Transmission System, Selected Alternate Routes From Lynndyl Site
GL29	Lynndyl Site Transmission System
GL30	" " " "
GL34	" " " "
GL35	" " " "
GL36	" " " "
GL37	" " " "
GL38	" " " "
GL39	" " " "
GL50	" " " "
L1	Project Map
L2	Undisturbed Plant Site (Photograph)
L3	Community Expansion Flow Diagram and Schedule
L4	Sevier River Hydrograph
1.4.3-1	Schematics of Typical 345-kV Structures
1.4.3-2	Schematics of Typical 230-kV Structures



NOTES:
 A.C. = ASPHALTIC CONCRETE
 C.A.B. = CRUSHED AGGREGATE BASE MATERIAL

INTERMOUNTAIN POWER PROJECT
 ROADS
 TYPICAL CROSS SECTIONS
 FIGURE A23

APPROVED: *[Signature]* DATE: 4-18-79



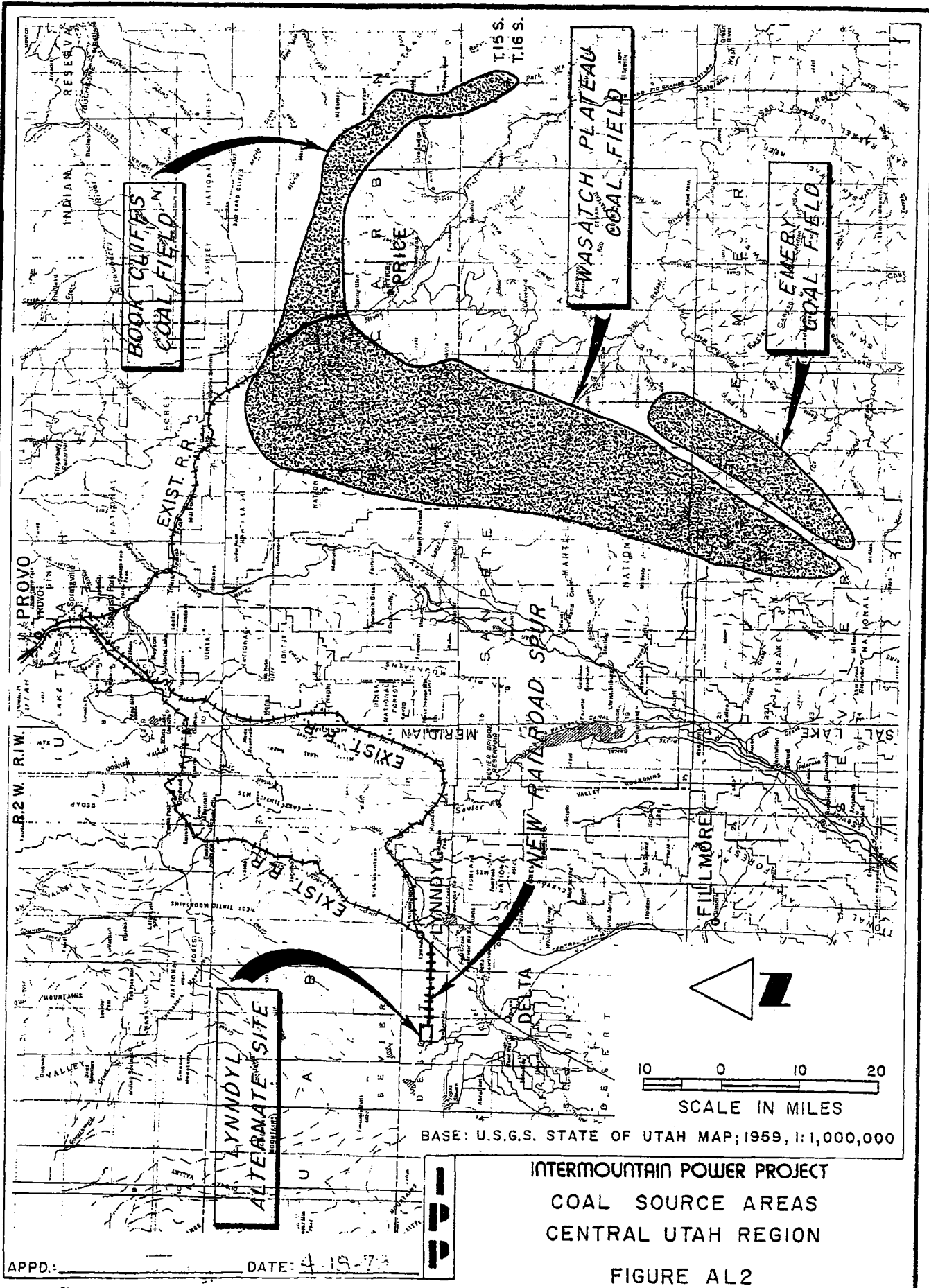
APPD.: *JH Anthony* DATE: 4-18-79

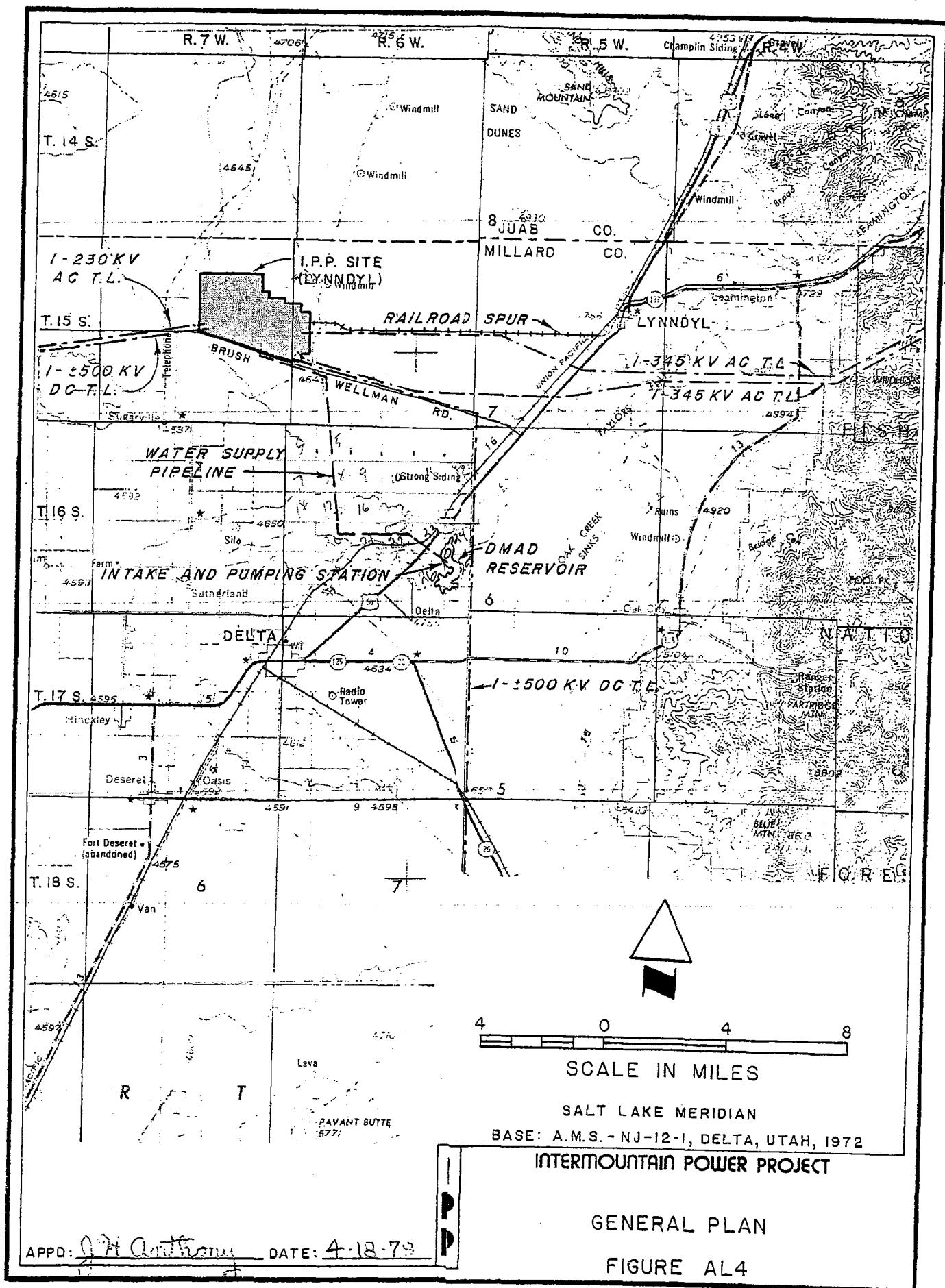
IPP

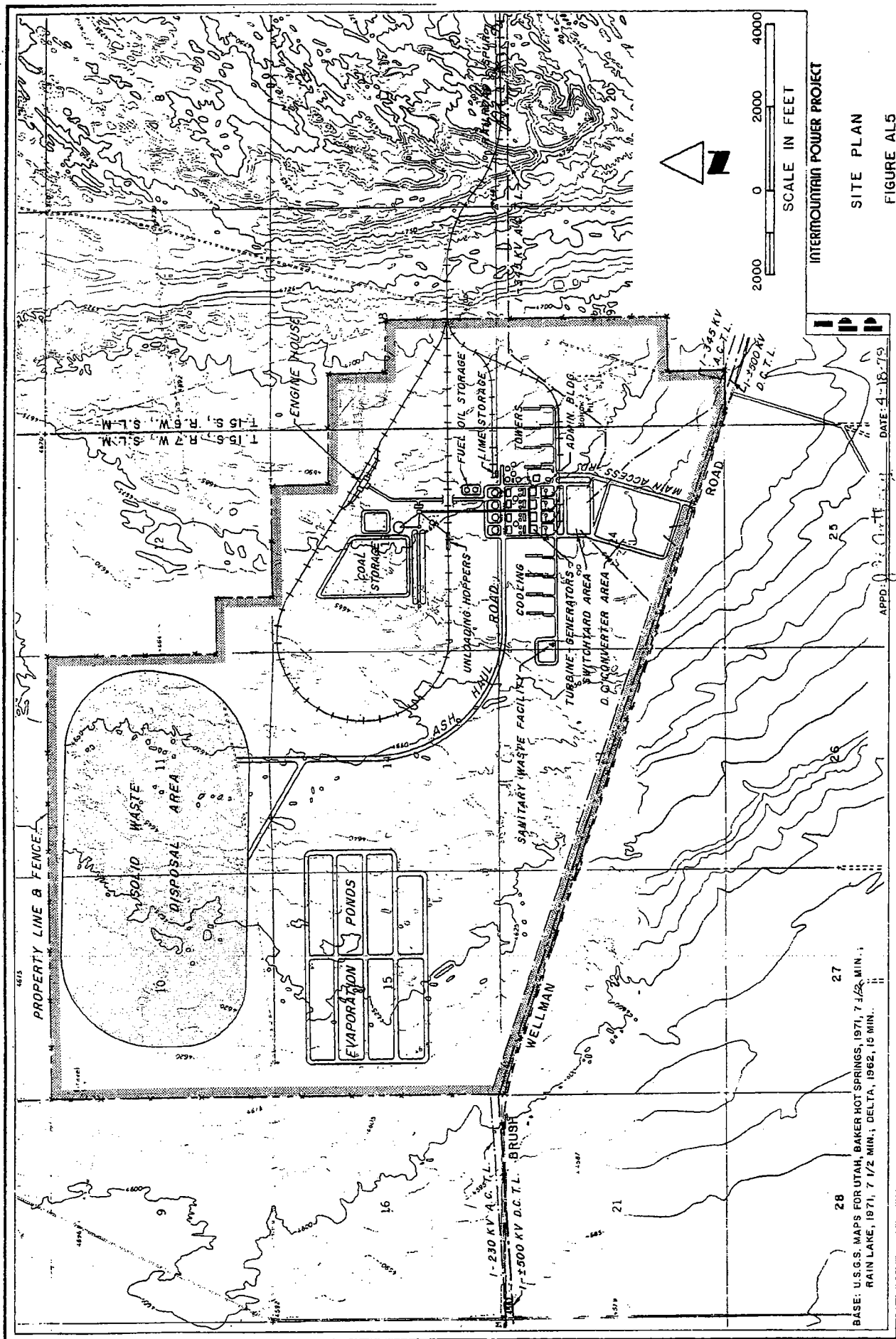
INTERMOUNTAIN POWER PROJECT

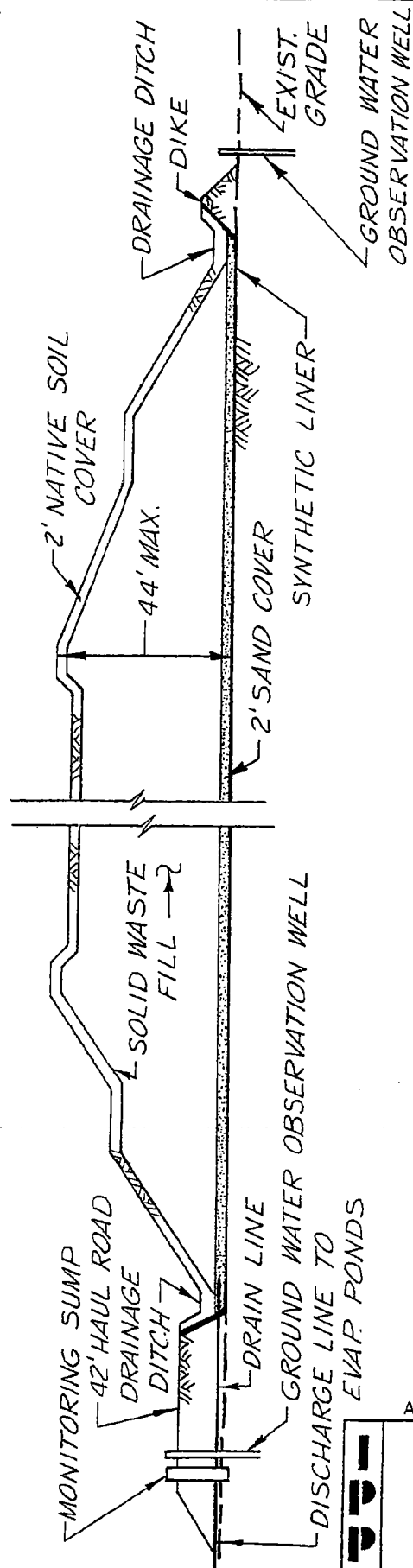
LOCATION MAP

FIGURE ALI









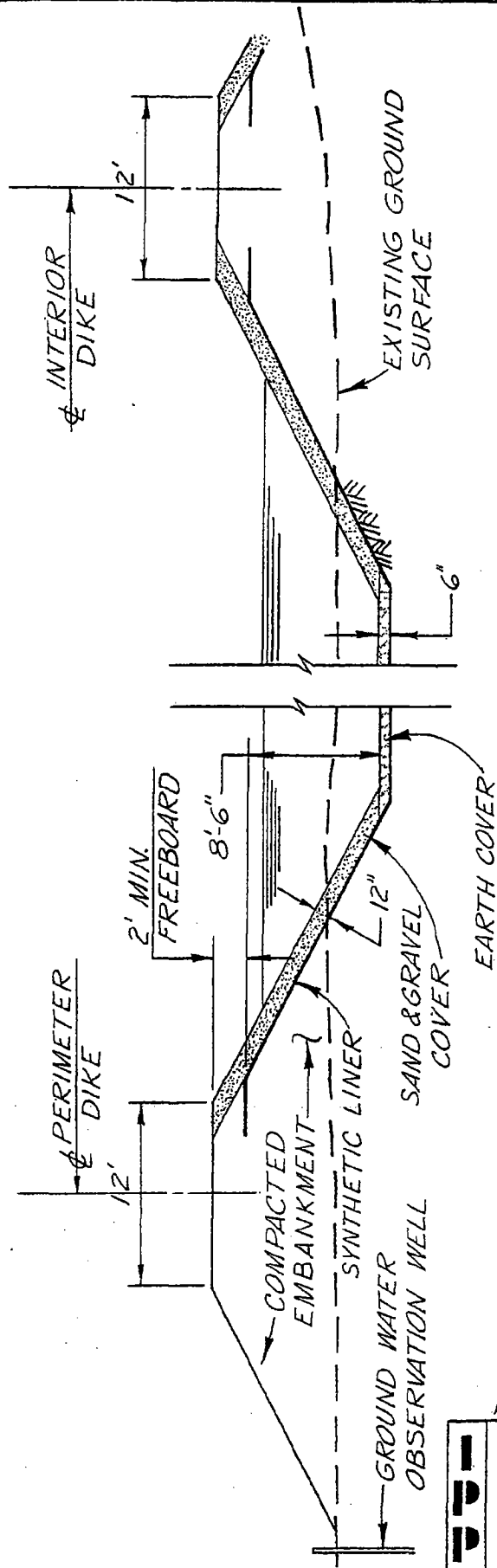
TYPICAL SECTION

APPD: *J. H. Anthony* DATE: 4-18-79

INTERMOUNTAIN POWER PROJECT

SOLID WASTE DISPOSAL AREA

FIGURE AL7

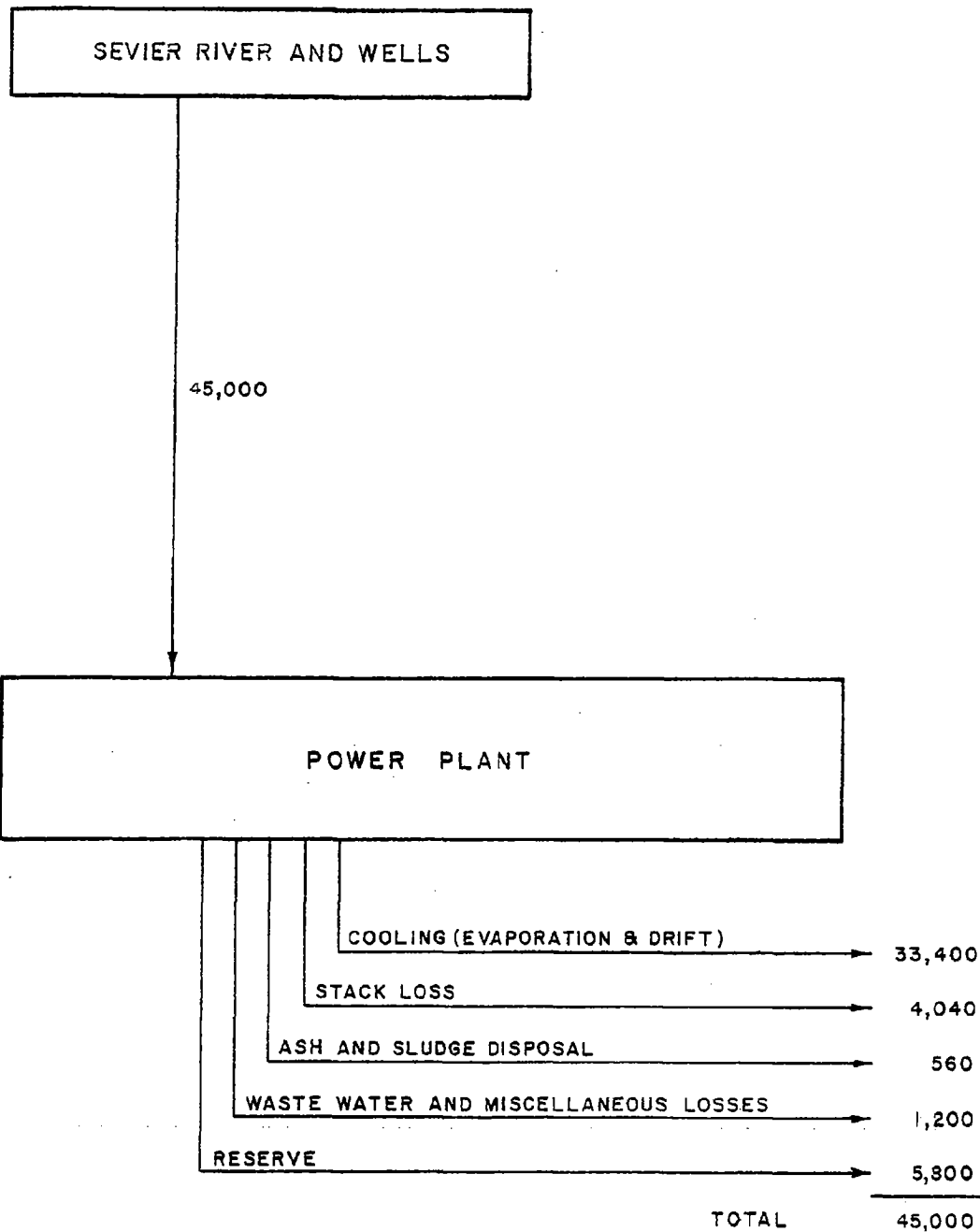


TYPICAL SECTION

APPD: *J. H. Antikarov* DATE: 4-18-79
INTERMOUNTAIN POWER PROJECT

EVAPORATION PONDS

FIGURE AL8



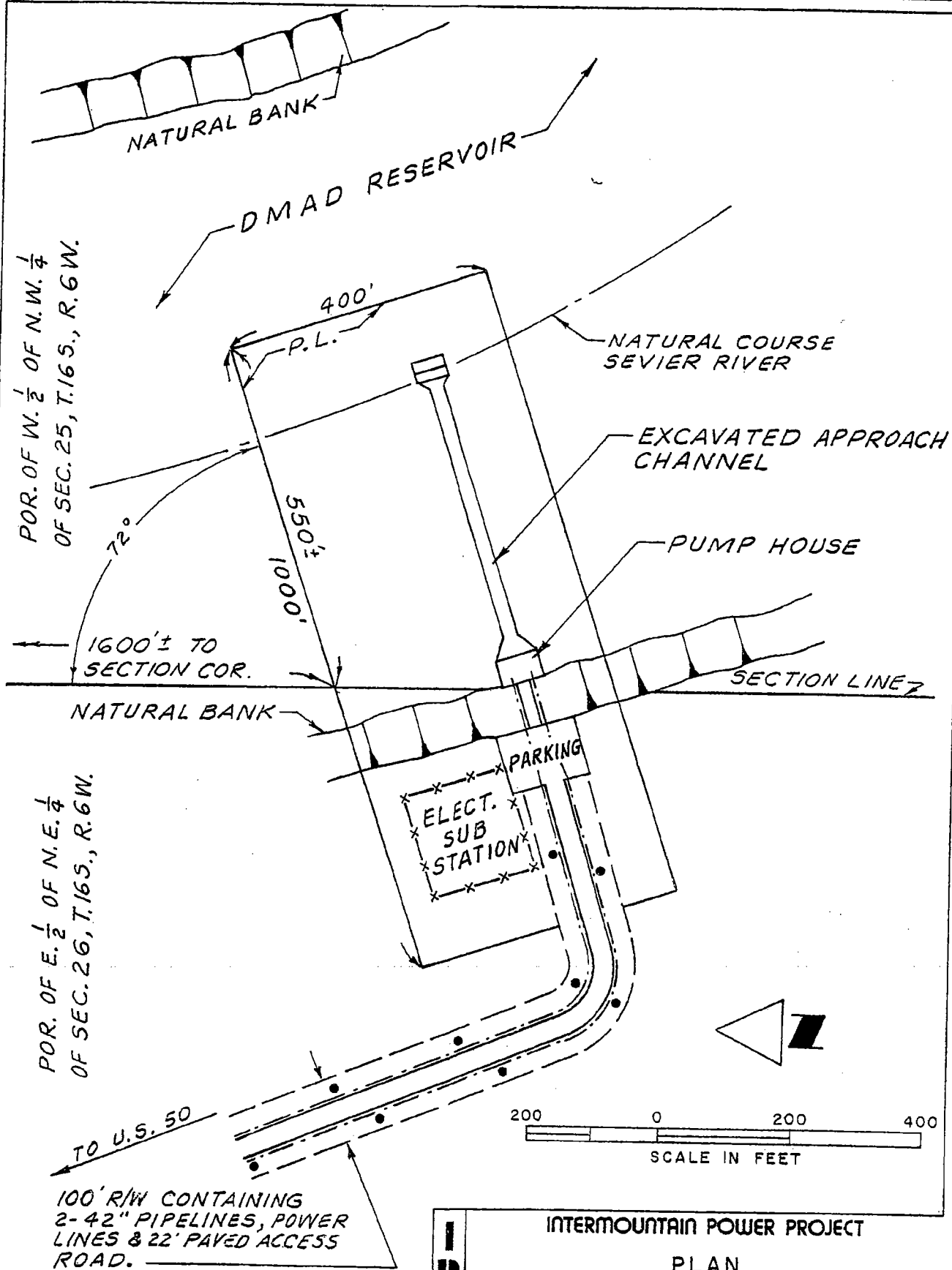
NOTE: ALL NUMBERS INDICATE ACRE-FEET OF WATER PER YEAR; BASED ON ANTICIPATED MEAN AVERAGES, NORMAL WEATHER CONDITIONS, AND AN 85 PERCENT PLANT CAPACITY FACTOR.



INTERMOUNTAIN POWER PROJECT PROJECT WATER BUDGET

APPD: 000000 DATE: 1-1-70

FIGURE AL9



APPD:

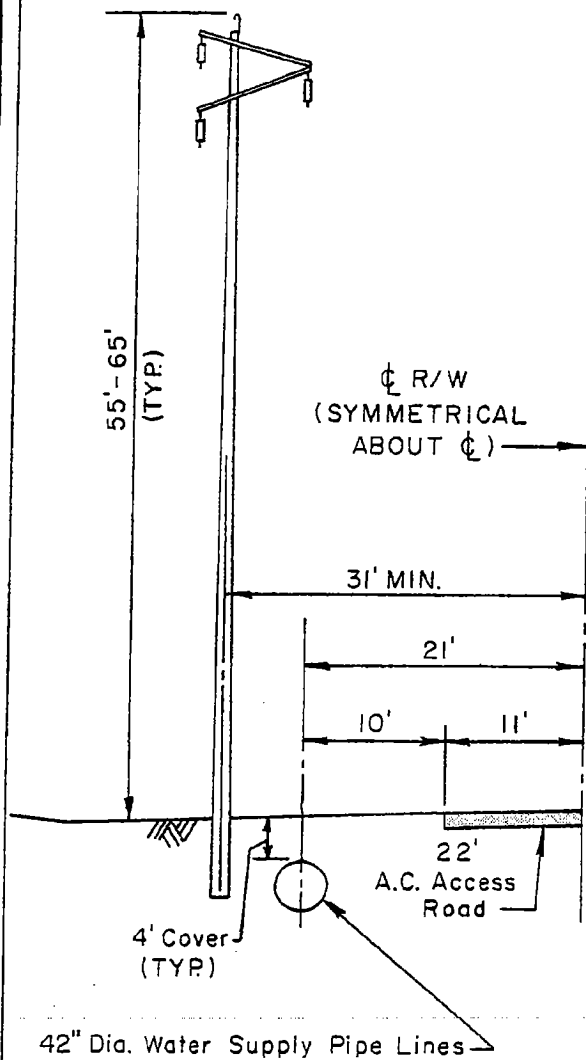
04/11/79

DATE: 4-18-79

IP

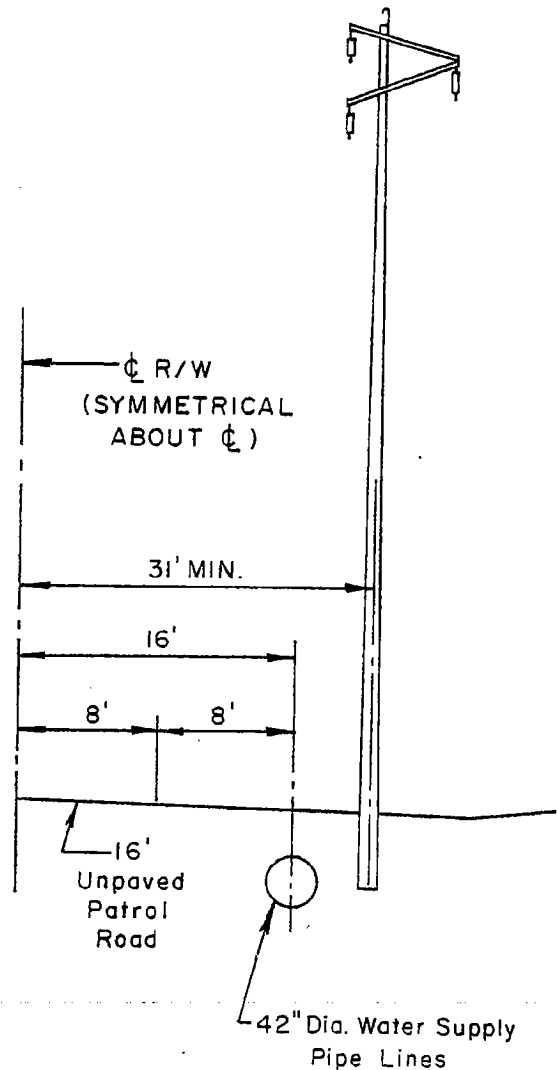
INTERMOUNTAIN POWER PROJECT
PLAN
INTAKE & PUMPING STATION
FIGURE AL13

46 KV
Subtransmission
Power Supply Lines
To Pumping Station



SOUTHEAST OF U.S. HWY. 50

46 KV
Subtransmission
Power Supply Lines
To Pumping Station



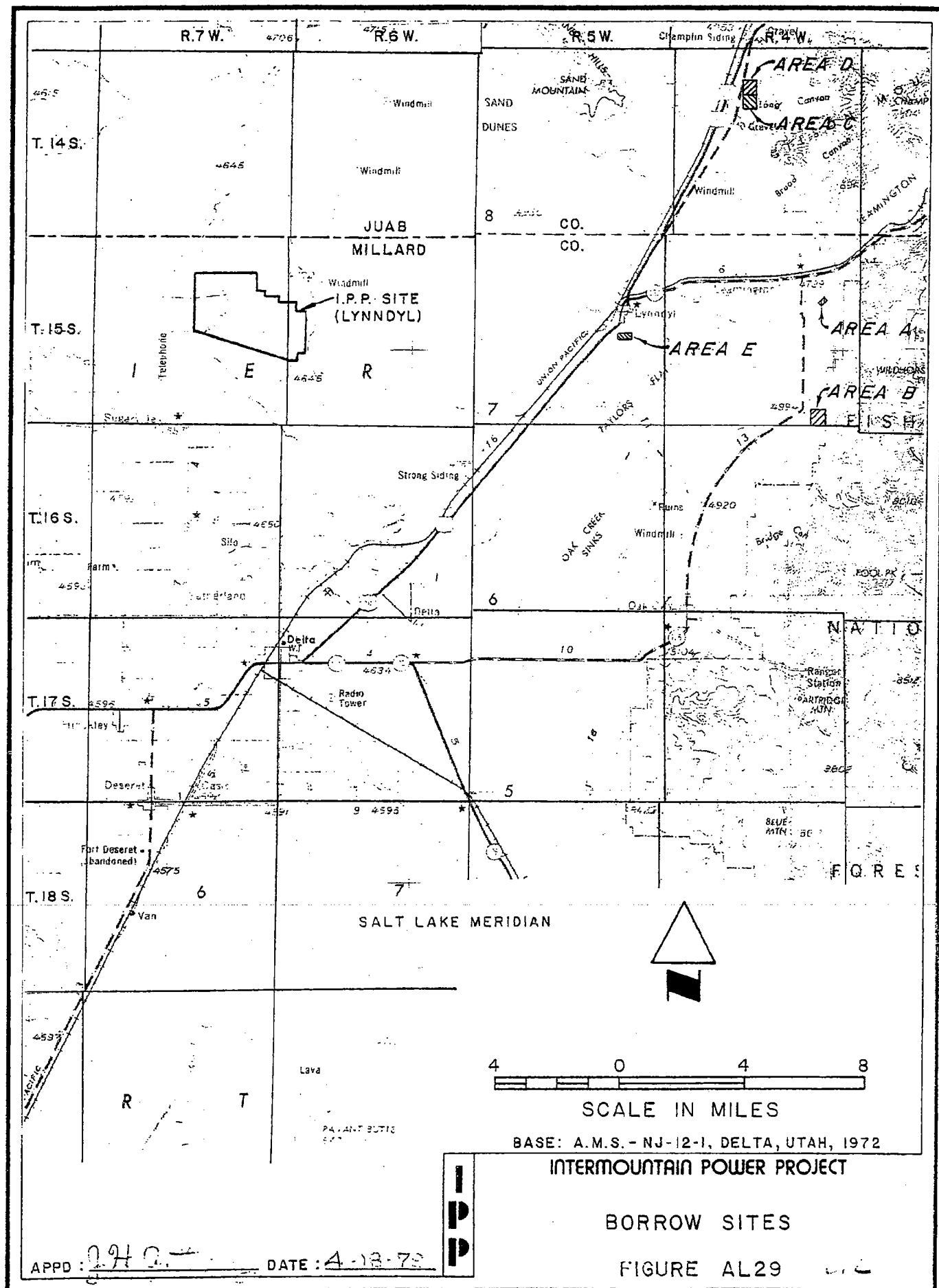
NORTHWEST OF U.S. HWY. 50

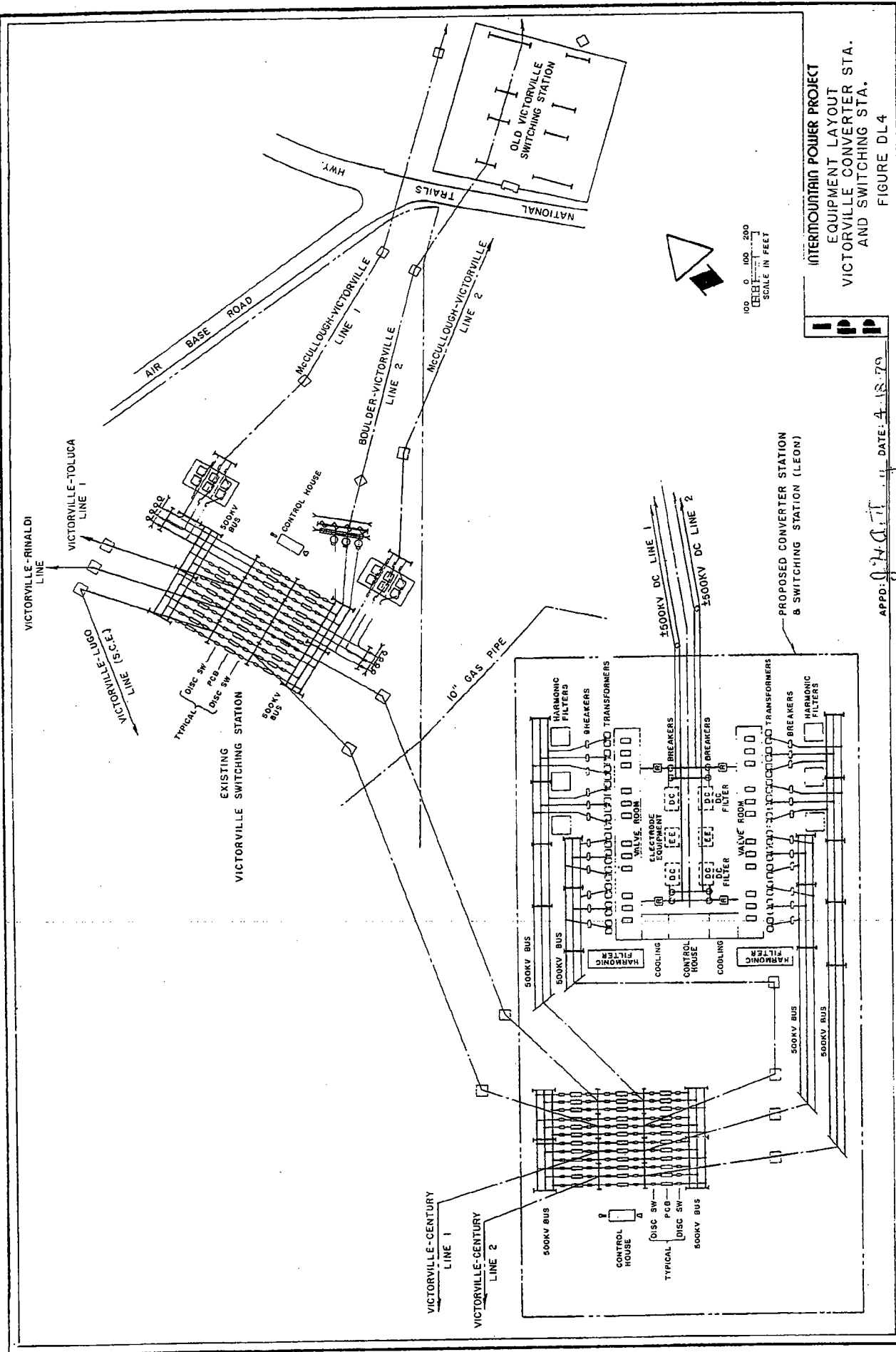
IP
P

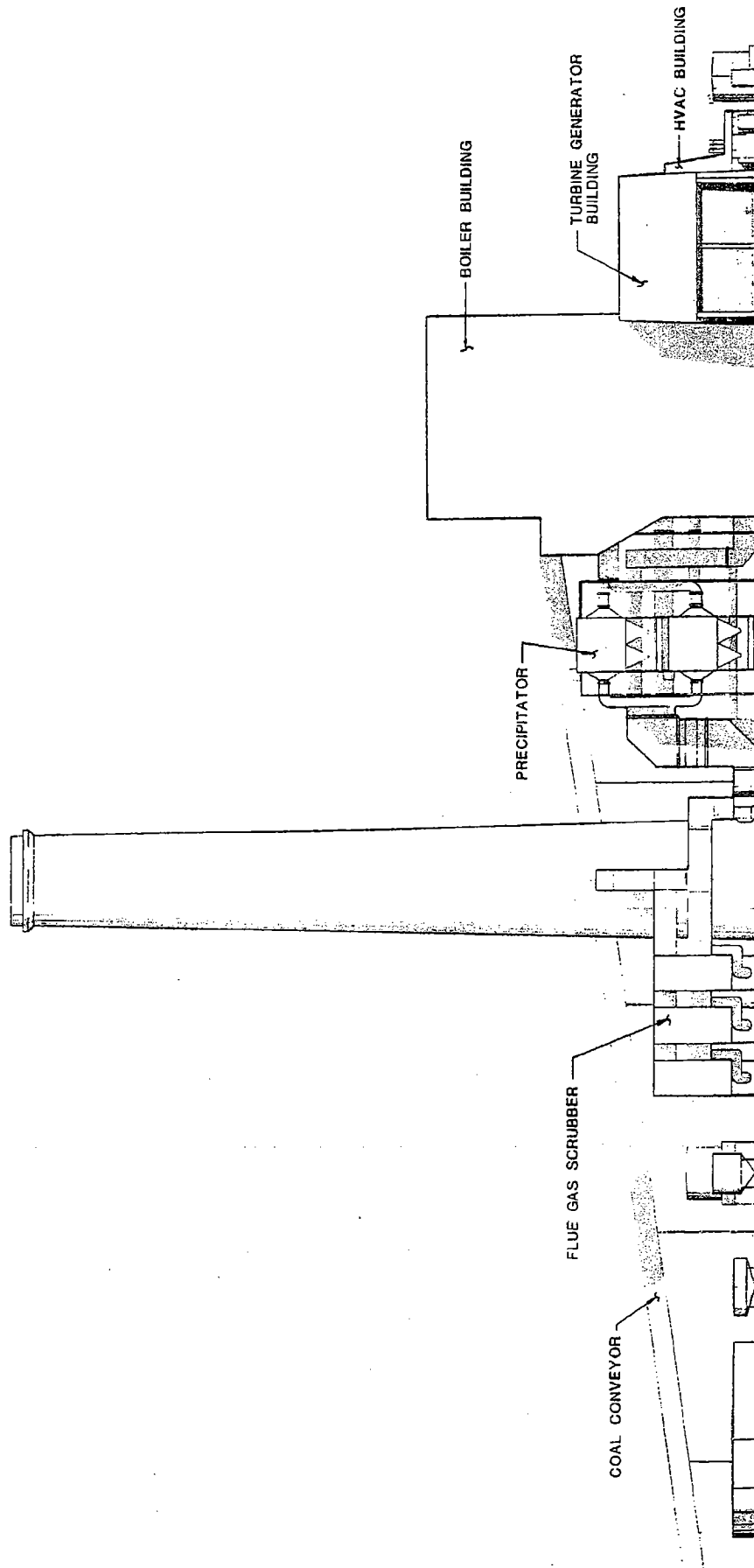
INTERMOUNTAIN POWER PROJECT
TYPICAL SECTIONS
UTILITY CORRIDOR

FIGURE AL28

APPD: *JH Ant...* DATE: 4-18-79



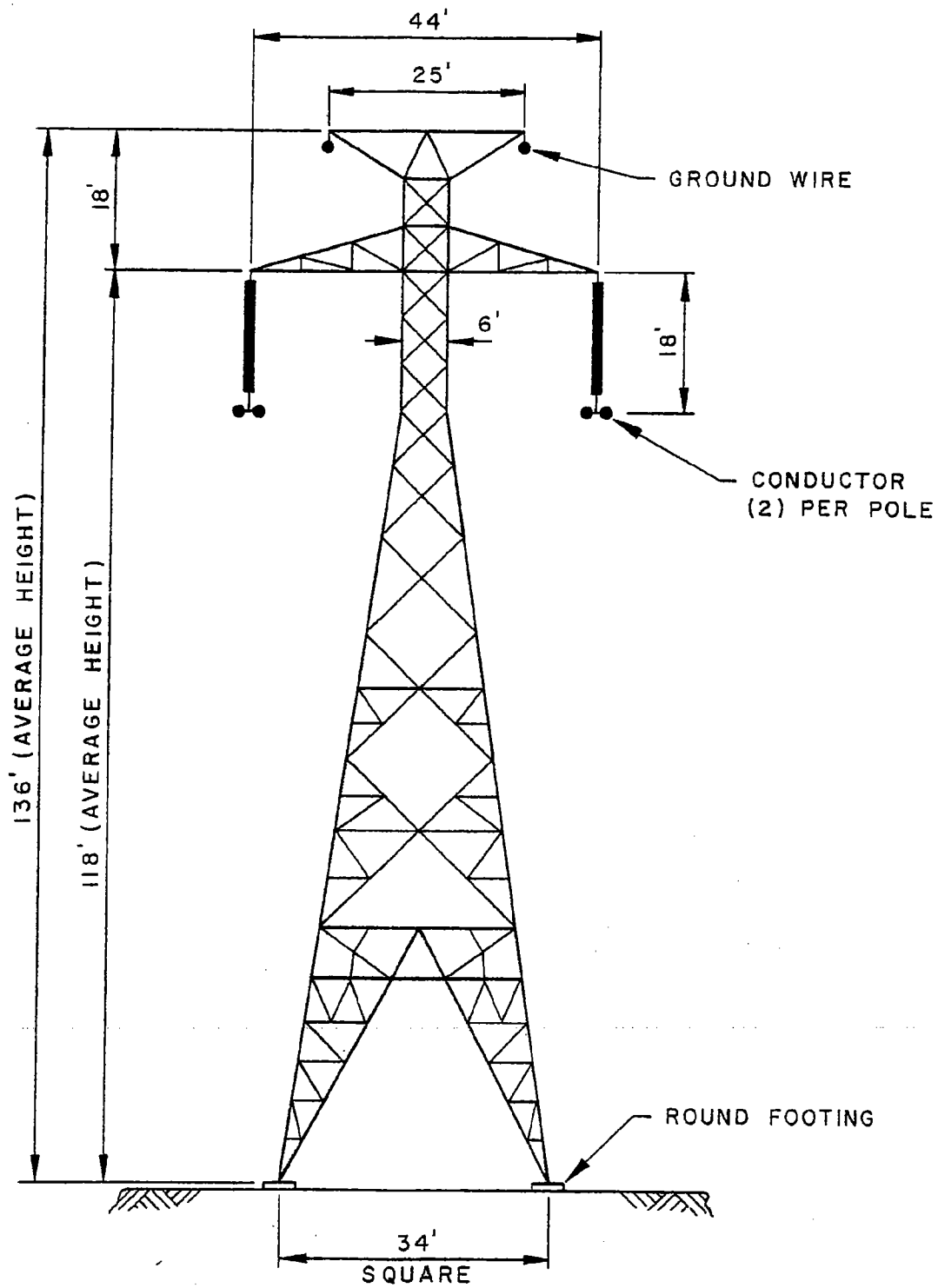




INTERMOUNTAIN POWER PROJECT
MAIN PLANT
PLANT WEST ELEVATION
FIGURE EL3

SCALE IN FEET
100 50 0 100 200

APPD: *Q. A. E. E.* DATE: 4 15 73



SCALE: NONE

INTERMOUNTAIN POWER PROJECT
TYPICAL $\pm 500\text{KV}$ DC BIPOLAR
FREESTANDING SUSPENSION TOWER

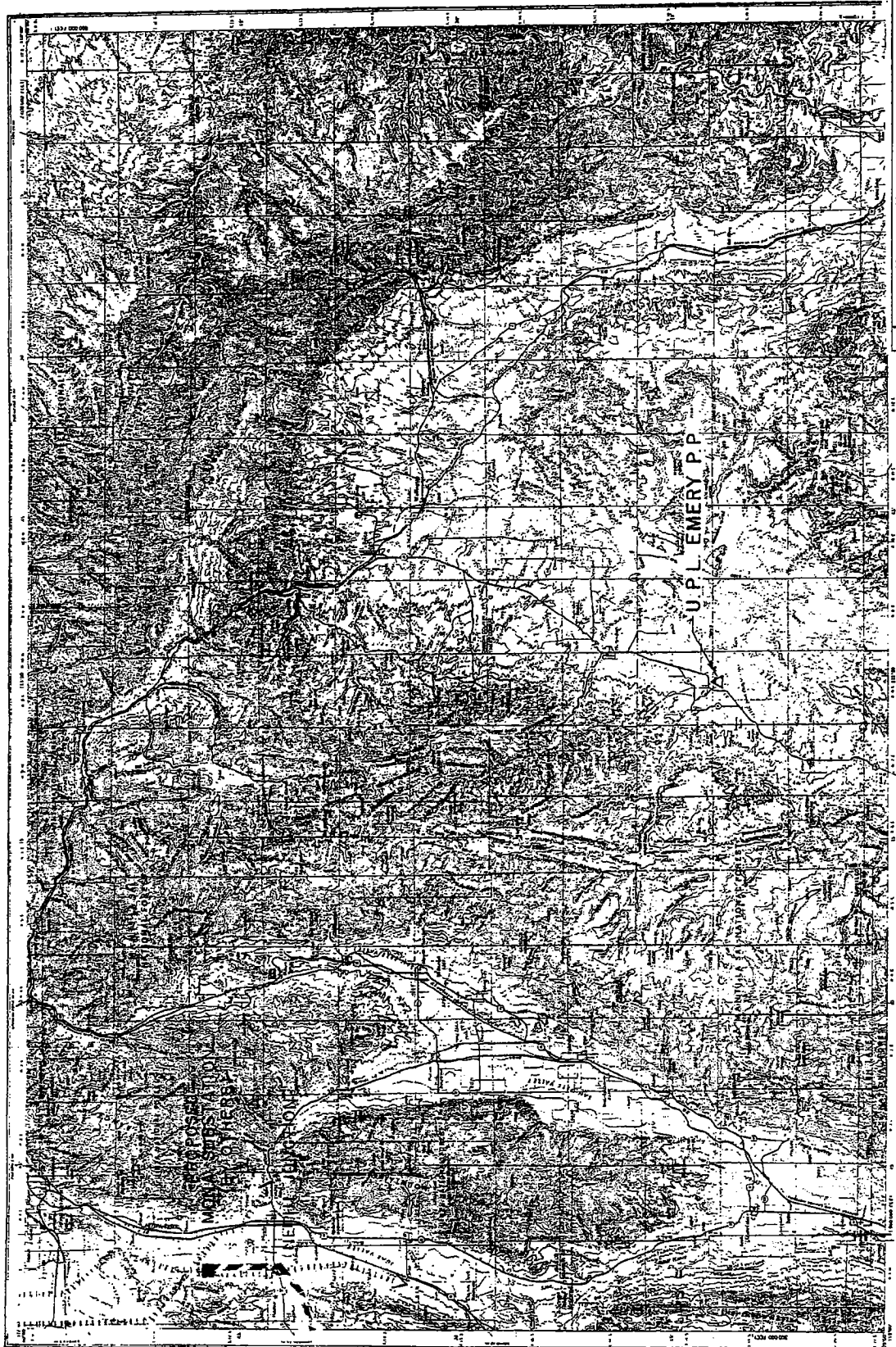
APPD: *JH Anthony* DATE: 4-18-79

IP

FIGURE G20

401122

PRICE



CONT'D ON FIG. GL50

CONT'D ON FIG. GL30

NOTE:

SEE FIG. GL28 FOR LEGEND AND INDEX



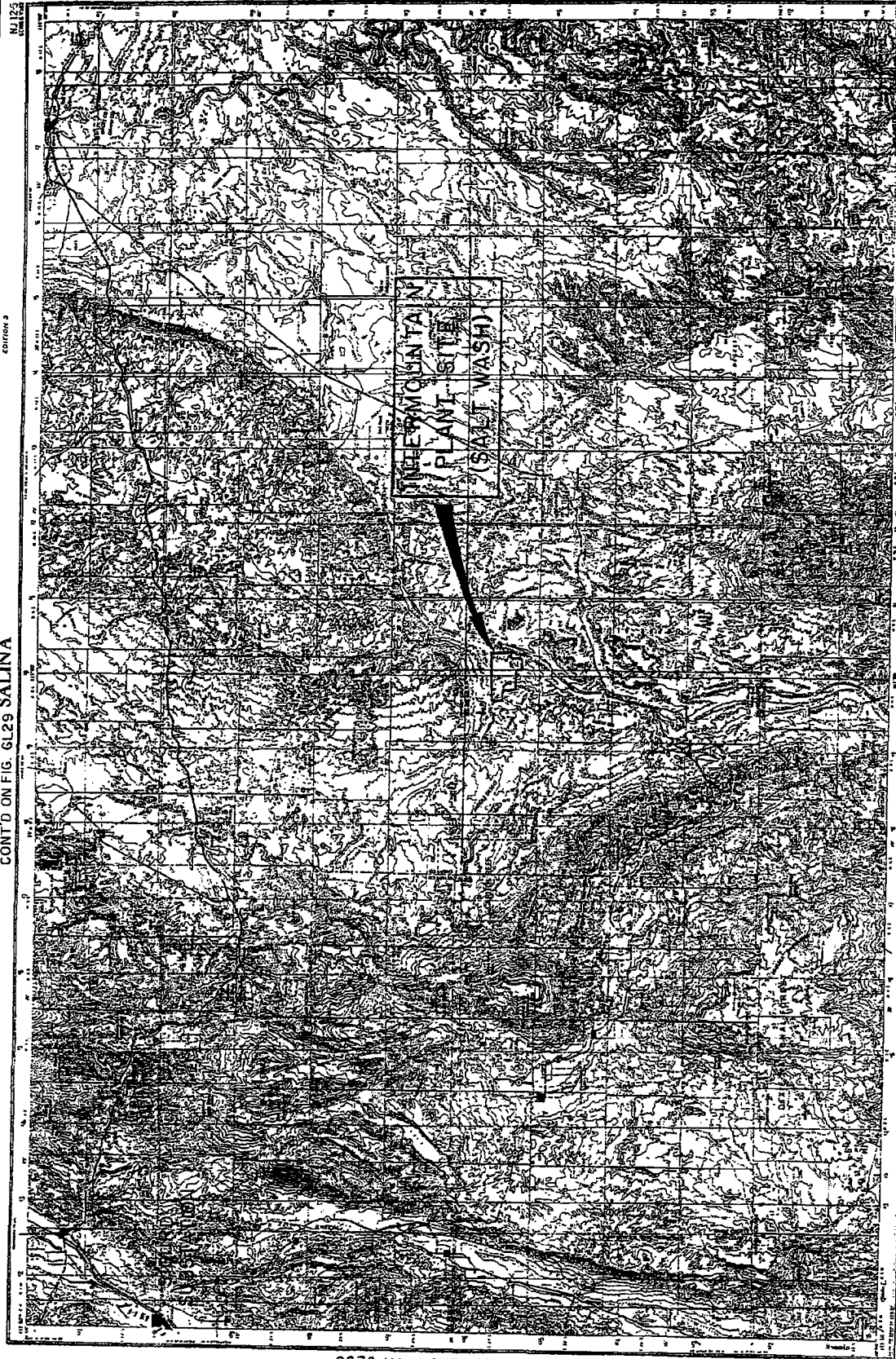
SCALE:
1"=8 MI.

INTERMOUNTAIN POWER PROJECT
LYNN DYL SITE
TRANSMISSION SYSTEM
FIGURE GL29

APPROVED FOR CONSTRUCTION
DATE: 11/1/62
BY: A.M.S. - PRICE, UTAH; 1962

WESTERN UNITED STATES

CONT'D ON FIG. GL29 SALINA



CONT'D. ON FIG. GL35

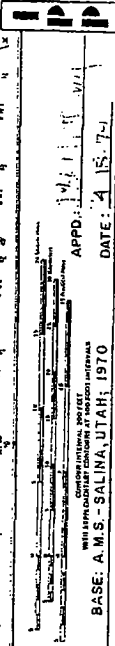


SCALE:
1"=8MI.

CONT'D. ON FIG. GL 31

NOTE:

SEE FIG. GL28 FOR LEGEND AND INDEX



INTERMOUNTAIN POWER PROJECT

LYNN DYL SITE

TRANSMISSION SYSTEM

FIGURE GL30

APPD.: 1/11/71
DATE: 4 15 71
BASE: A.M.S. - SALINA, UTAH, 1970

INTERMOUNTAIN POWER PROJECT

LYNN DYL SITE

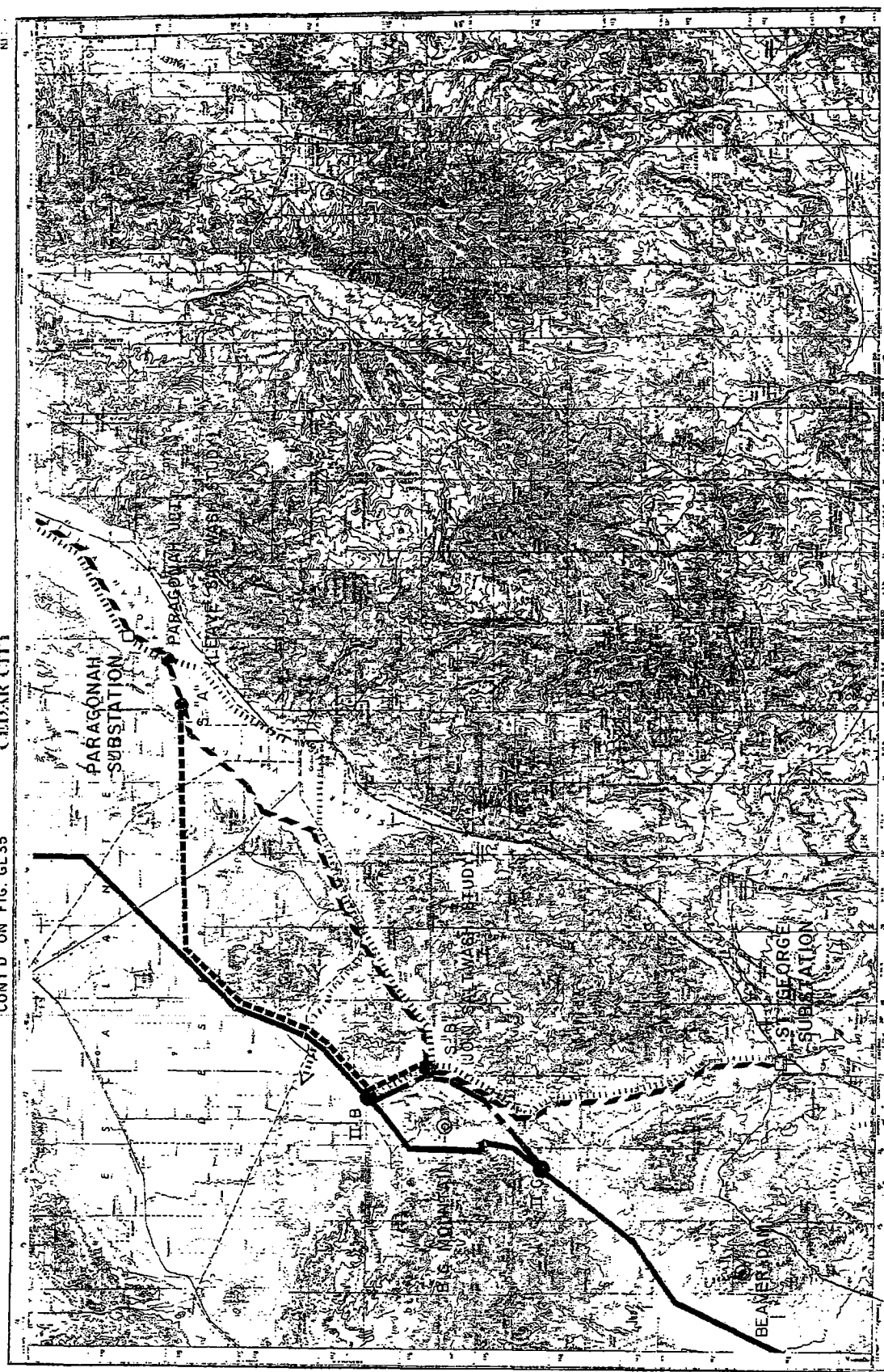
TRANSMISSION SYSTEM

FIGURE GL30

NOTE:

SEE FIG. GL28 FOR LEGEND AND INDEX

CONT'D ON FIG. GL35 CEDAR CITY



CONT'D ON FIG. GL38

CONT'D ON FIG. GL33

NOTE:
SEE FIG. GL28 FOR LEGEND AND INDEX

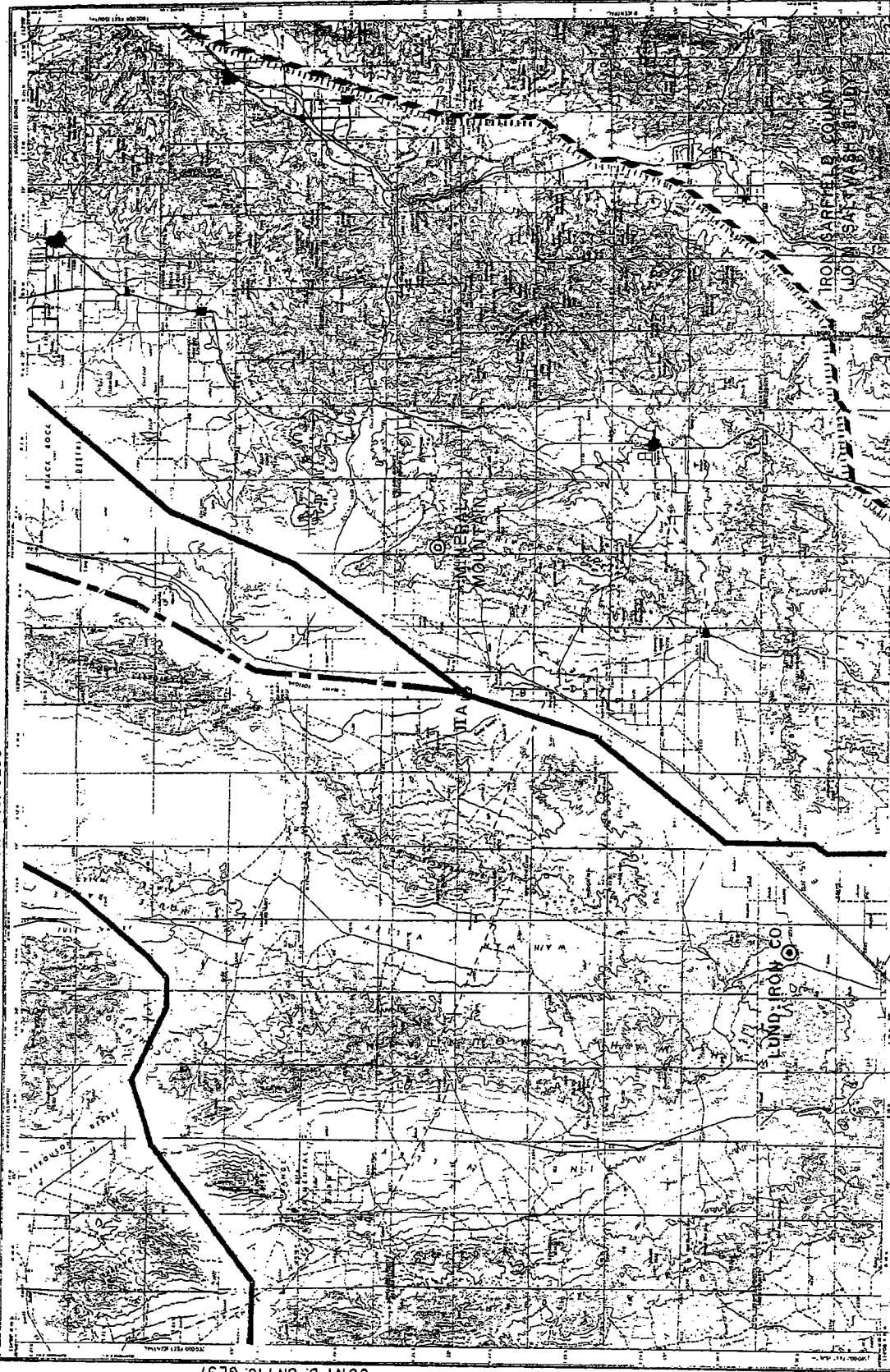
BASE: A.M.S. - CEDAR CITY, UTAH, 1961
CONSOLIDATED 1961
DATE: 4-18-79
APPROVED: *[Signature]*
DATE: 4-18-79

INTERMOUNTAIN POWER PROJECT
LYNN DYLL SITE
TRANSMISSION SYSTEM
FIGURE GL34

WESTERN UNITED STATES

CONT'D ON FIG. GL50 RICHFIELD

NJ12-4



CONT'D. ON FIG. GL37

CONT'D. ON FIG. GL30



SCALE:
1"=BM1.

NOTE:

SEE FIG. GL28 FOR LEGEND AND INDEX

CONT'D. ON FIG GL34

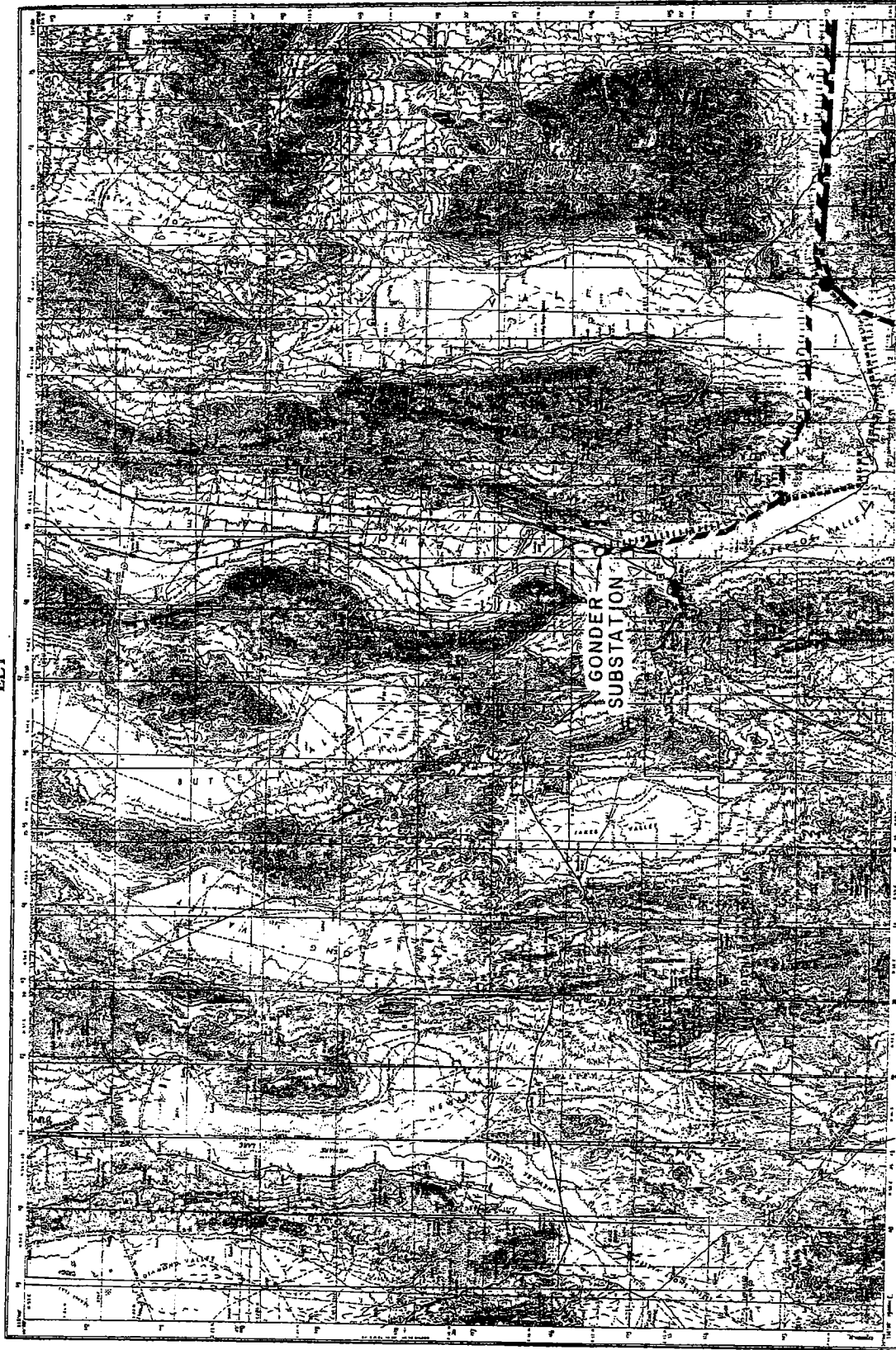
APPD: 02/11/71
DATE: 4-18-71
BASE: A.M.S. - RICHFIELD, UTAH, 1962

INTERMOUNTAIN POWER PROJECT

LYNN DYLL SITE
TRANSMISSION SYSTEM

FIGURE GL35

ELY



SCALE:
1"=8MI.

NOTE:

SEE FIG. GL28 FOR LEGEND AND INDEX

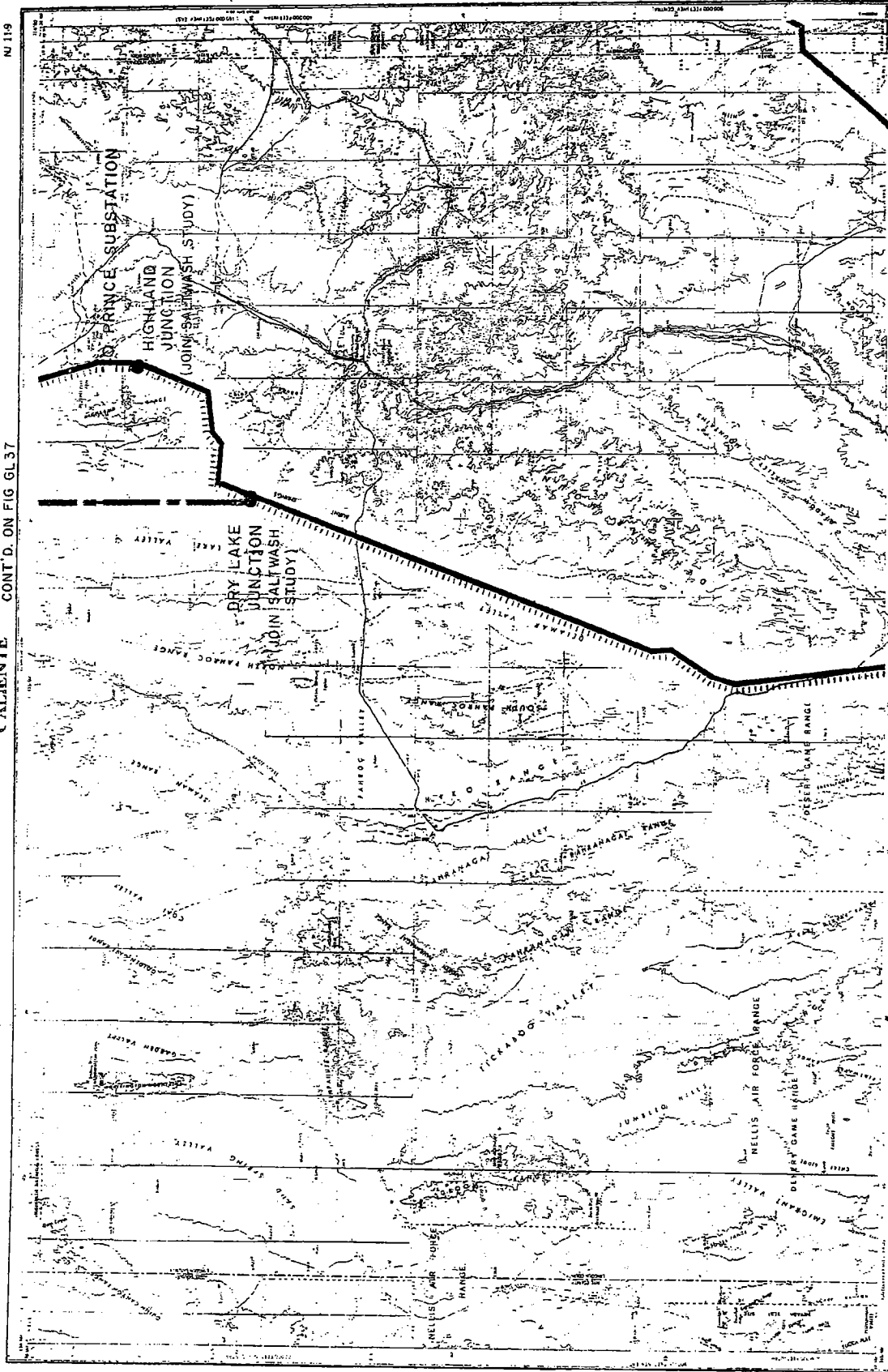
CONT'D. ON FIG. GL37

BASE: A.M.S. - ELY, NEVADA; 1971
APPD: 02.11.73
DATE: 1/73

INTERMOUNTAIN POWER PROJECT

LYNN DYLL SITE
TRANSMISSION SYSTEM
FIGURE GL36

CONT'D. ON FIG. GL50



SCALE:
1"=8M).

NOTE:

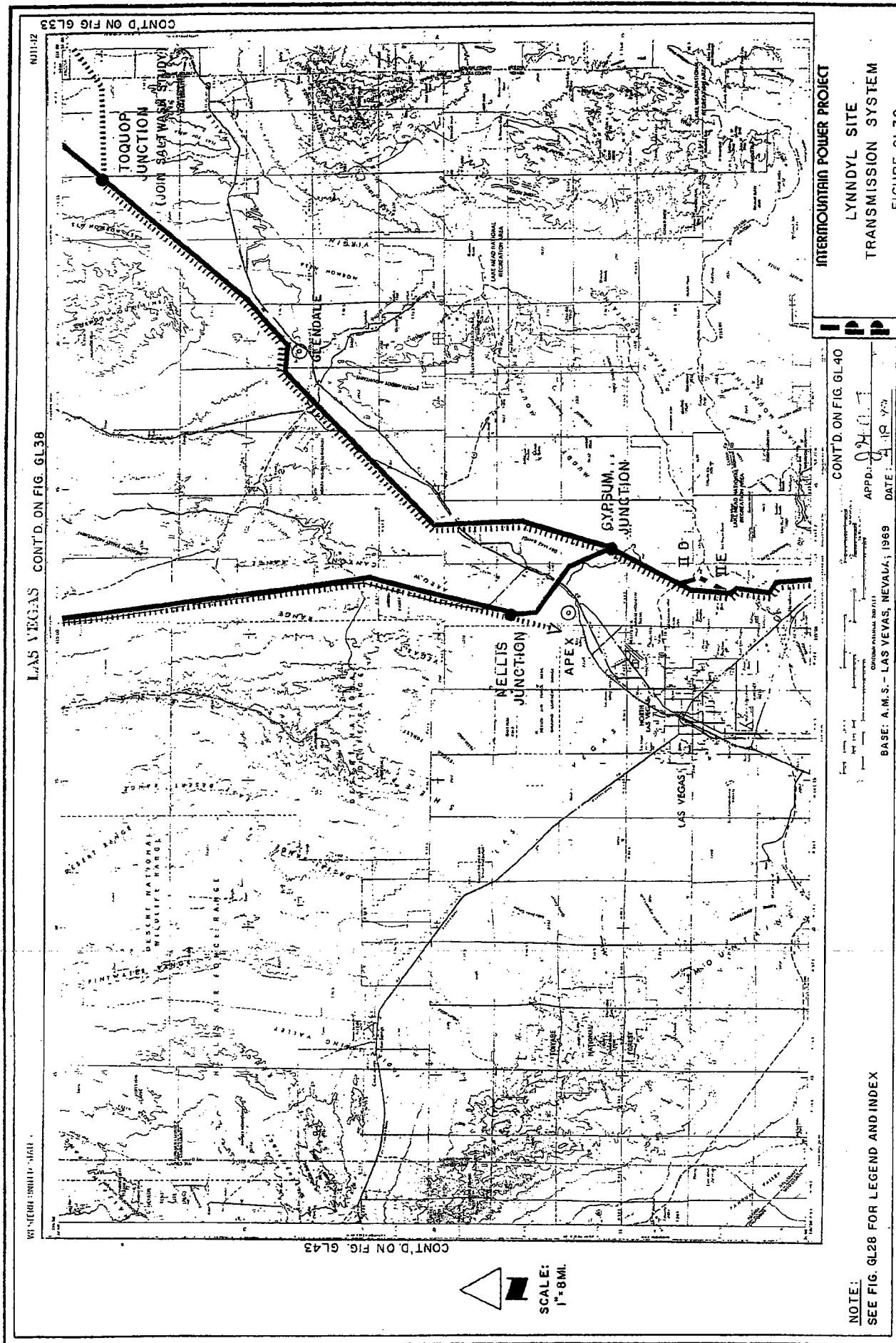
SEE FIG. GL28 FOR LEGEND AND INDEX

CONT'D. ON FIG. GL39

BASE: A.M.S. - CALIENTE, NEVADA; 1954

LINDLE SITE
TRANSMISSION SYSTEM

FIGURE GL38



NOTE:
SEE FIG. GL28 FOR LEGEND AND INDEX

INTERMOUNTAIN POWER PROJECT
LYNN DYL SITE
TRANSMISSION SYSTEM
FIGURE GL39

CONT'D. ON FIG. GL40

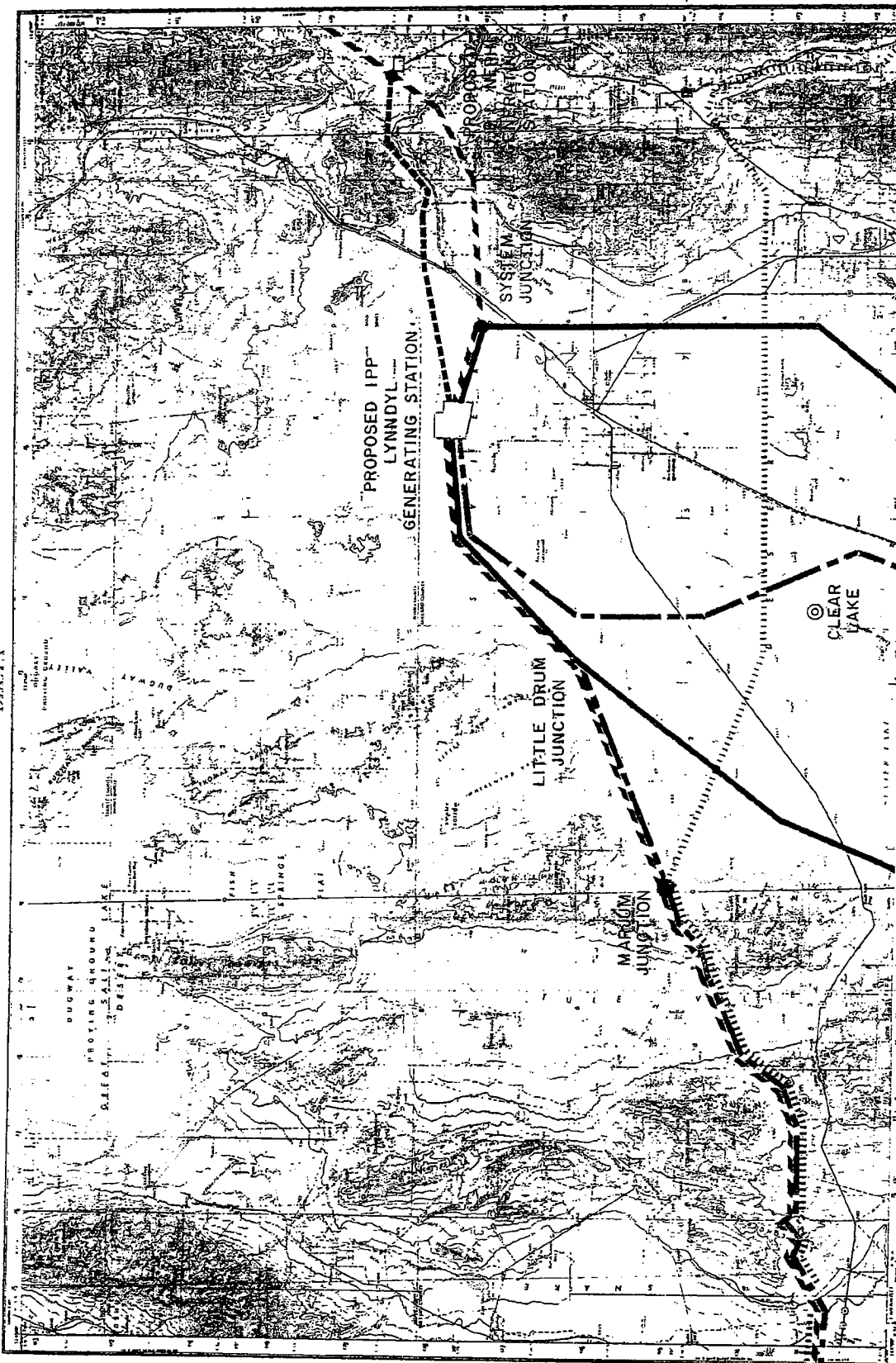
APPD: 04.01.7
DATE: 18.7.79

BASE: A.M.S. - LAS VEGAS, NEVADA; 1969

CONT'D. ON FIG. GL43

SCALE: 1" = 8 MI.

Y. J. Xie



CONT'D ON FIG. 6L29

CONT'D ON FIG. 6L36

SCALE:
1"=8 MI.

NOTE:
SEE FIG

SEE FIG. GL28 FOR LEGEND AND INDEX

CONT'D ON FIG. GL35

INTERMOUNTAIN POWER PROJECT

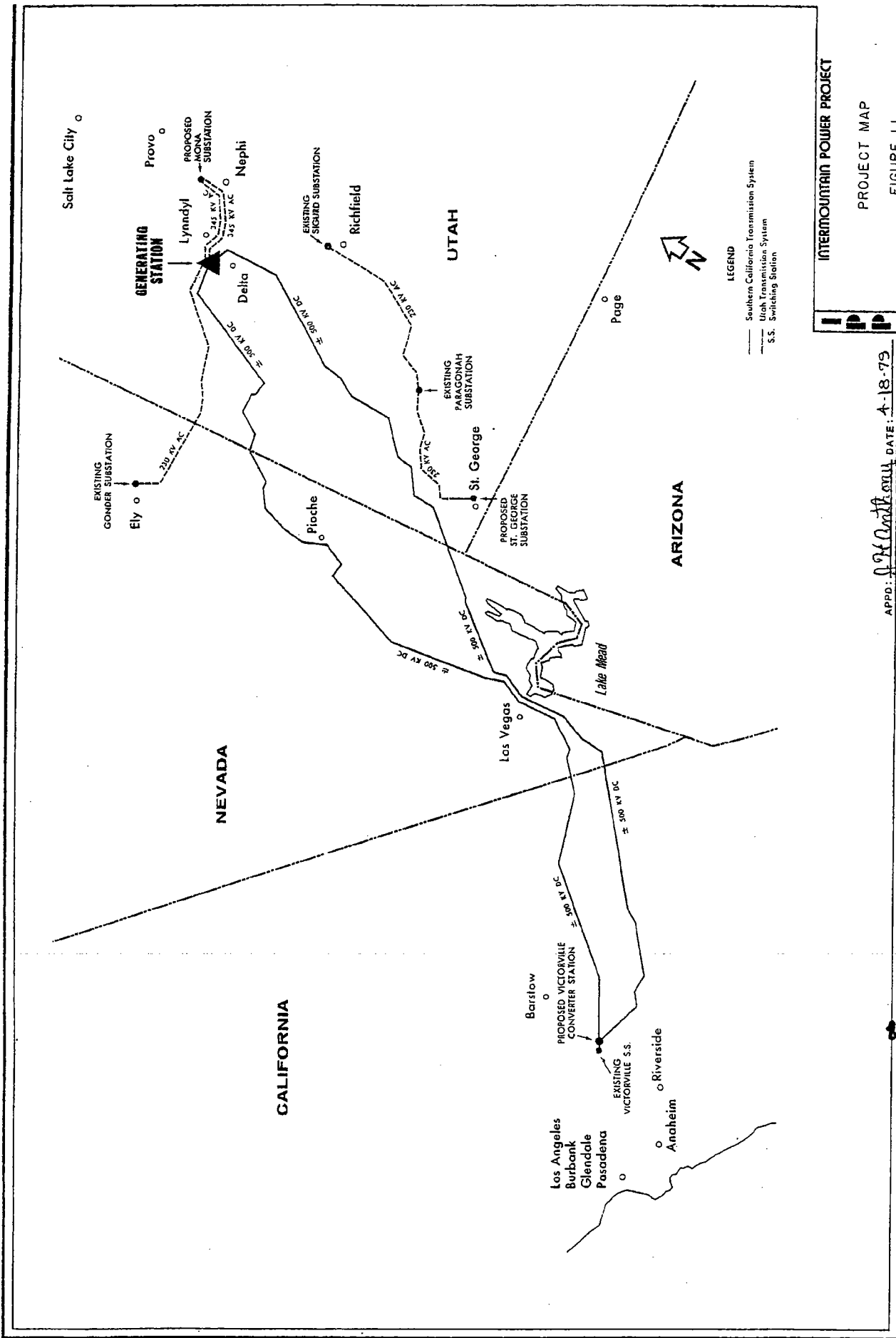
LYNDYL SITE

TRANSMISSION SYSTEM.

FIGURE GL50

APPROVED: J. J. Anthony
DATE: 4-18-79 J

BASE: A.M.S. - DELTA, UTAH 1962



APPROVED: *J. H. Smith* DATE: 4-18-79

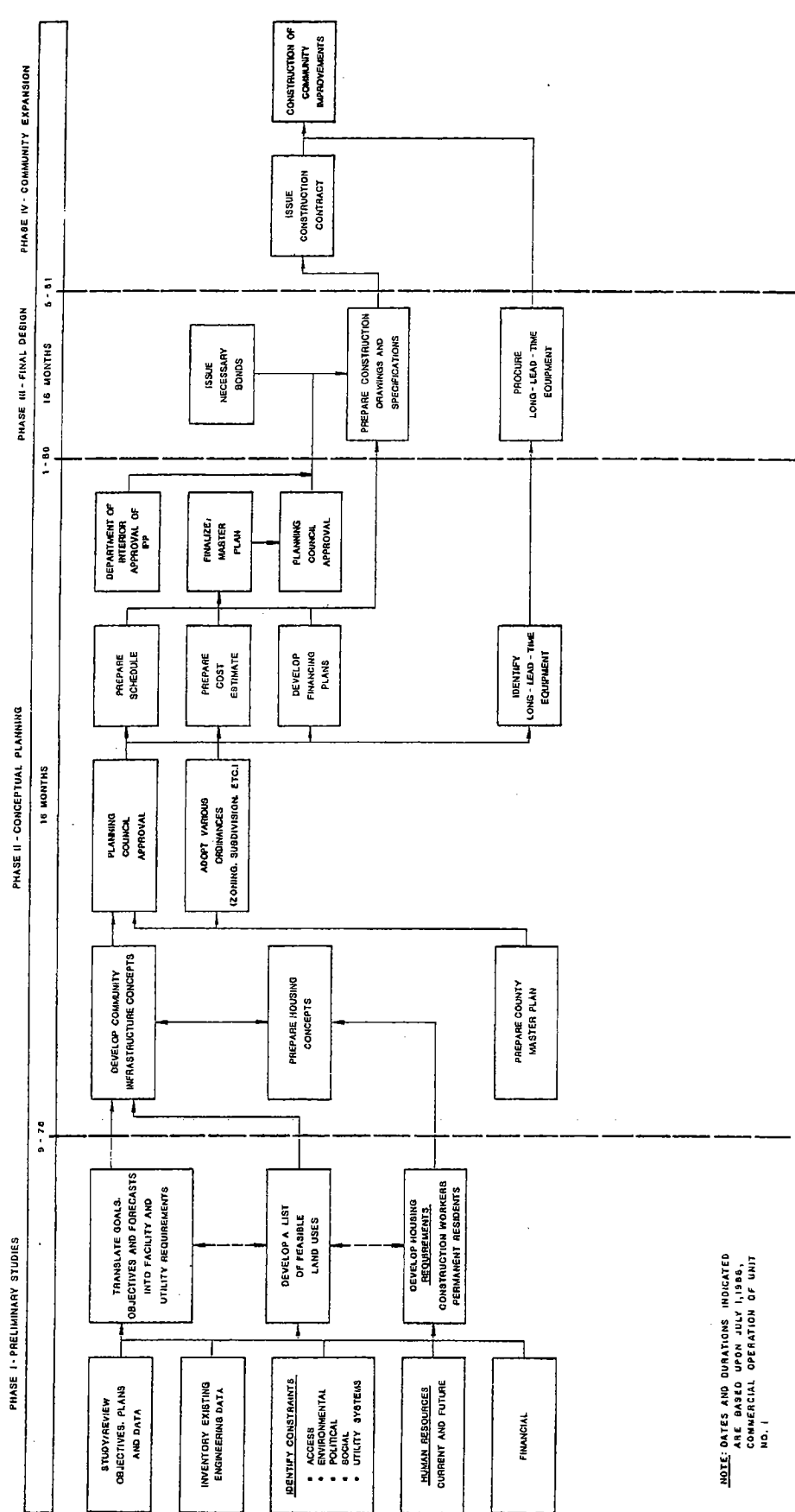
PROJECT MAP
FIGURE LI

INTERMOUNTAIN POWER PROJECT

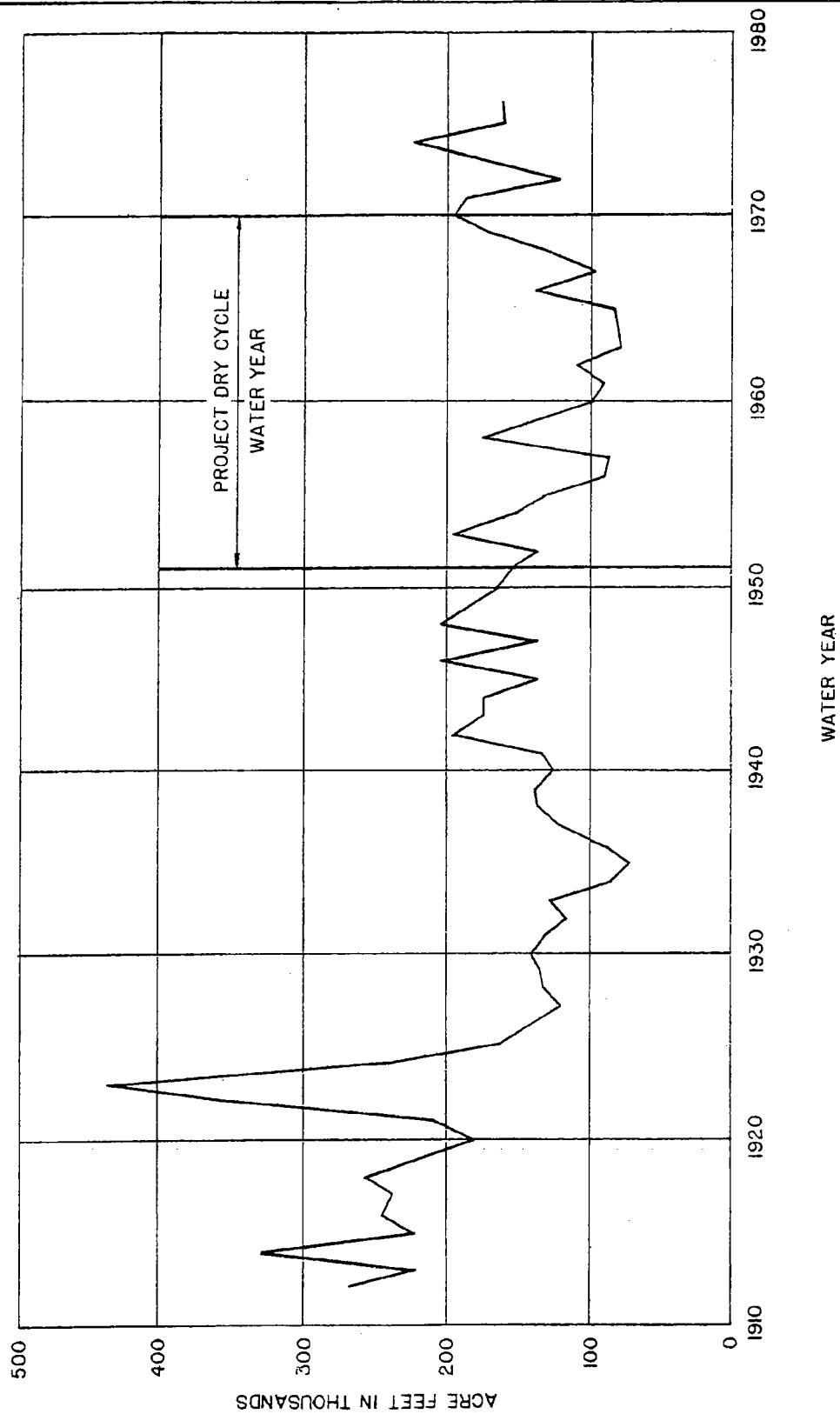
IP



WESTERLY VIEW OF
UNDISTURBED PLANT SITE
FIGURE L2



APPD: J. H. Anthony DATE: 4-18-79



SEVIER RIVER NEAR JUAB, UTAH
U.S.G.S. GAGE NO. 10222000

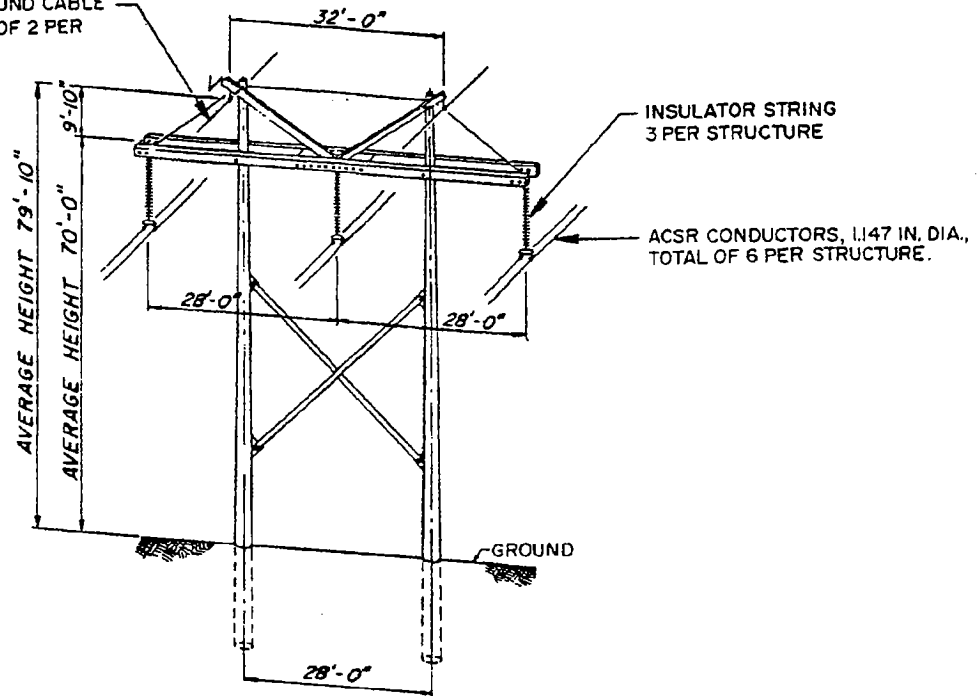
INTERMOUNTAIN POWER PROJECT

HYDROGRAPH
SEVIER RIVER
1910 - 1976
FIGURE L4

APPD: *JH Anthony* DATE: *4-18-79*

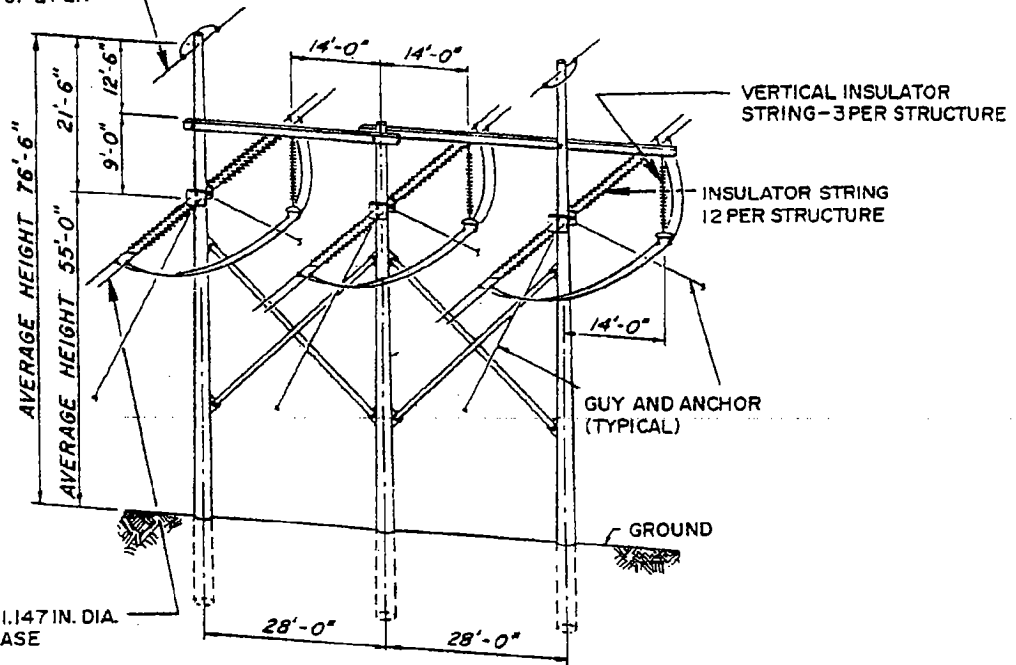


STRANDED STEEL GROUND CABLE
0.4375 IN. DIA., TOTAL OF 2 PER
STRUCTURE.



(a) SUSPENSION STRUCTURE

STRANDED STEEL GROUND CABLE
0.4375 IN. DIA., TOTAL OF 2 PER
STRUCTURE



(b) DEAD-END STRUCTURE

INTERMOUNTAIN POWER PROJECT

SCHEMATICS OF TYPICAL 345 KV STRUCTURES

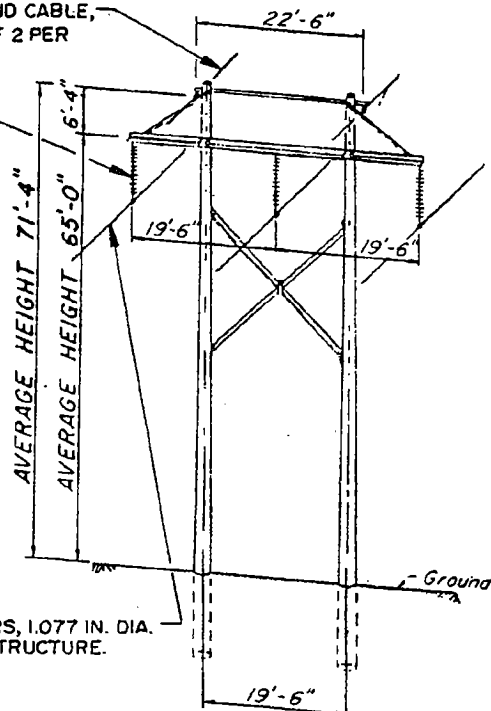
APPD: *J. H. Anthony* DATE: *4-18-79*

I
P
P

FIGURE 1.4.3-1

STRANDED STEEL GROUND CABLE,
0.4375 IN. DIA., TOTAL OF 2 PER
STRUCTURE.

INSULATOR STRING
3 PER STRUCTURE

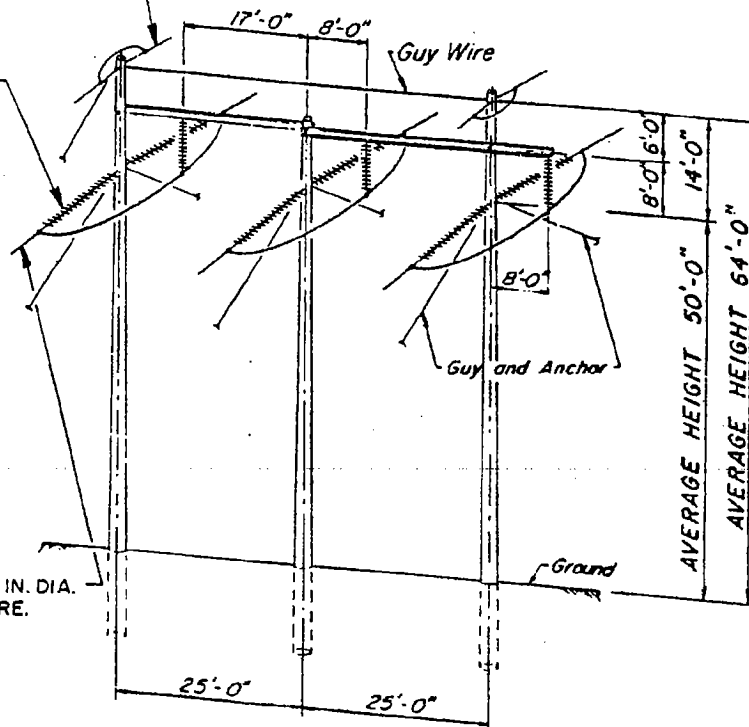


ACSR CONDUCTORS, 1.077 IN. DIA.
TOTAL OF 3 PER STRUCTURE.

STRANDED STEEL GROUND CABLE,
0.4375 IN. DIA., TOTAL OF 2 PER
STRUCTURE.

INSULATOR STRING
9 PER STRUCTURE

(a) SUSPENSION STRUCTURE



ACSR CONDUCTORS, 1.077 IN. DIA.
TOTAL OF 3 PER STRUCTURE.

(b) DEAD-END STRUCTURE

INTERMOUNTAIN POWER PROJECT

SCHEMATICS OF TYPICAL 230 KV STRUCTURES

APPD: *J. H. Anthony*

DATE: 4-18-79

IP
P

FIGURE 1.4.3-2